

# DEFENSE INDUSTRY BULLETIN

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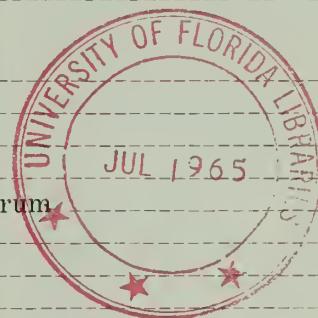
June 1965

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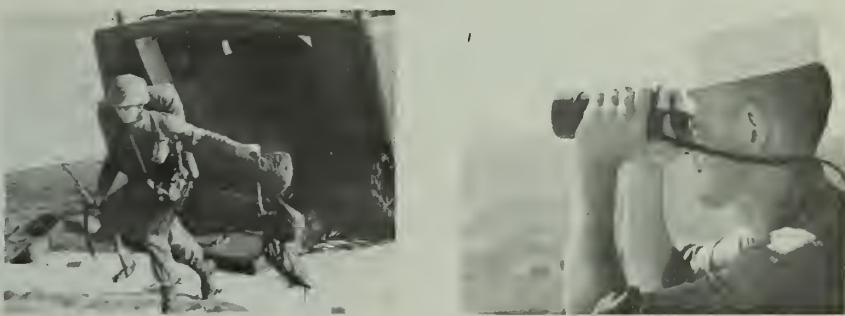


## DEPARTMENT OF DEFENSE



Publication of  
ASSISTANT SECRETARY OF  
DEFENSE-PUBLIC AFFAIRS

### The Navy-Marine Corps Customer



"The Navy deploys its surface, sub-surface and airborne systems from the polar regions of the globe to the tropics and from outer space to the deepest depths of the oceans. . . . I mention these aspects of Navy systems to explain that, as a Navy contractor, you may encounter unusual specifications. But stringent contractual requirements make good sense when viewed from the perspective of the demands which might be made on the product, as well as from our outlook as taxpayers eager to get the most for our defense dollars."

The foregoing is quoted from the presentation by Vice Admiral I. J. Galantin, Chief of Naval Material, at the recent DOD-NSIA Advanced Planning Briefings for Industry. Highlights from the Navy addresses made at the briefings begin on page 15. The July issue of the *Bulletin* will carry highlights of the Air Force presentation.

The Editors.



## DEFENSE INDUSTRY BULLETIN

Published by the Department of Defense

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The purpose of the *BULLETIN* is to serve as a means of communication between the Department of Defense (DOD) and its authorized agencies and defense contractors and other business interests. It will serve as a guide to industry concerning official policies, programs and projects, and will seek to stimulate thought by members of the defense-industry team in solving the problems that may arise in fulfilling the requirements of the DOD.

Material in the *BULLETIN* is selected to supply pertinent unclassified data of interest to the business community. Suggestions from industry representatives for topics to be covered in future issues should be forwarded to the Business & Labor Division.

The *BULLETIN* is distributed each month to the agencies of Department of Defense, Army, Navy, and Air Force, and to representatives of industry. Request for copies should be addressed to the Business & Labor Division, OASD/PA, Room 2E813, The Pentagon, Washington, D.C. 20301, telephone, OXFORD 5-2709.

Contents of the magazine may be reprinted freely without requesting permission. Mention of the source will be appreciated.

# Col. R. A Scurlock, USAF

## New ASPR Chairman

Colonel Reagan A. Scurlock, USAF, has assumed the duties of Chairman of the Armed Services Procurement Regulation Committee in the Office of the Assistant Secretary of Defense (Installations and Logistics). He succeeds Colonel Roger H. Terzian, USAF, who has returned to the Air Staff.

The Armed Services Procurement Regulation Committee is composed of representatives of the Office of the Secretary of Defense, Army, Navy, Air Force and Defense Supply Agency. It is responsible for developing and maintaining uniform policies and procedures for the procurement of all defense supplies and services. It also prescribes standard contract forms and clauses used in military contracts.

Colonel Scurlock is a graduate of the University of Texas Law School and a member of the Texas Bar. He was assigned as Procurement Officer at Headquarters, Air Materiel Command, in 1951. Subsequently, he had various assignments in military procurement and related fields, culminating in that of Chief, Procurement and Production, Electronic Systems Division, Air Force Systems Command.

Members of the Armed Services Procurement Regulation Committee include:

Louis A. Cox, Office of the Assistant Secretary of Defense (Installations and Logistics), Alternate Chairman; Edward C. Cox, Army Policy Member; Colonel Arthur Slade, Army Legal Member; LeRoy Haugh, Navy Policy Member; Albert Green, Navy Legal Member; Major J. B. Pompan, Air Force Policy Member; Edmund Kelly, Air Force Legal Member; Robert Lintner, Defense Supply Agency Policy Member; Maurice Paradis, Defense Supply Agency Legal Member; Alfred B. Carter, Office of the Assistant Secretary of Defense (Installations and Logistics), Executive Secretary.



**The Original Corsair?**

The story on page 5 of the April *Bulletin* identified the F4U, a gull winged, World War II and Korean conflict fighter, as the original Corsair.

However, one of our readers took exception to our claim and sent the picture above of the 02U Corsair, which saw service in the 1930's, to prove it.

Our thanks to Mr. John F. McCauley, of Motorola, Inc., for the correction and the photo.

Corsair historians with pictures of even earlier models are invited to submit them.

The Editors.

# Major Crossroads in the Space Program

by

Major General Don R. Ostrander, USAF

America's space program today is at, or is rapidly approaching, some major crossroads in decision making. Before too many more weeks have slipped by us we are going to have to face up to the problems of where to go and how much to spend getting there.

Of course, the situation is not new in our business—it has been occurring, off and on, since 1957. But it seems to me that within a very short time we—and by we I mean all of us associated with the space program—are going to be faced with an unusually large number of these decisions—major decisions that will affect those involved in the space program in industry, Government and education as well as the military.

This is what I would like to deal with in this article. I would like for you to consider with me what the alternatives are, what kinds of decisions we will be required to make and what kinds of information we will need if we are to make those decisions sensible and profitable.

I want to start by making a few comments about the civilian side of our Federally-supported space program, the National Aeronautics and Space Administration. Before I comment, however, I must, in all fairness, explain that I am speaking essentially as a layman. Since leaving my assignment with NASA in 1961 I have not participated directly in the NASA programs or planning process—although I have had and still have a number of close relationships with the agency—and I must ask you to accept my observations in that light.

Although NASA has engaged in a great deal of serious and

conscientious planning, study and analysis from virtually the first day it was formed, it was not until 1960 that a really definitive and generally accepted, long-range plan emerged under the guidance of Homer Joe Stewart. The main thrust of that plan was toward a manned lunar landing, backed up with a broad spectrum of scientific experimentation, technological development and space applications.

That plan has been followed with remarkable consistency—considering the vagaries of this kind of business—to the present day. I don't need to recite the events of the past few years to demonstrate to a scientifically literate public that we are well on our way toward the goals that we set for ourselves five years ago. There have been some delays, failures and frustrations during that five years, and I

don't want to imply that there aren't a great many difficult problems ahead of us. But by and large they are engineering problems, rather than fundamental dilemmas with no solution in sight.

But after we have landed a man on the moon, where do we go from there? Do we continue with scientific exploration of the moon? Do we establish a colony there and shuttle scientists back and forth? Do we shift our attention to one of the nearer planets—probably Mars? Do we drop back to near-Earth space and attempt to further refine and consolidate and apply our knowledge? Do we place greater emphasis on scientific or upon technological and engineering progress?

I recognize that we will probably do some of all of these things. I recognize, too, that there are a great number of extremely competent and knowledgeable people engaged in trying to decide just how many of these programs we should support, in what proportion, and in which order. All I am trying to do here is emphasize the fact that there are a very large number of interesting and promising paths that we *can* take, and that the decision on which direction we go is not going to be easy, nor can it be made lightly.

In our military space program, it seems to me that we are rapidly approaching—if we haven't already arrived at—an equally critical period.

There are a great many people in the military who have been thinking about military missions in space since at least the early 1940's. Stimulated to some extent by the German scientists and engineers who had been involved in the German missile program, we were intrigued by the potentialities of rocket propulsion. It seems to me, as I look back, that in those days, during the 1940's and 1950's, we spent as much or more time thinking about space exploration



Maj. Gen. Don R. Ostrander, USAF, has been Commander of the Air Force's Office of Aerospace Research (OAR) since Sept. 1962. Prior to this assignment, as Director of Launch Vehicles for NASA from Dec. 1959 to Sept. 1962, he was in charge of NASA booster development and launching operations. A graduate of the U. S. Military Academy, General Ostrander has been active in the direction of Air Force research & development programs over the past 15 years.

as we did about immediate military applications. There were several reasons for this—no doubt the glamour and excitement of space exploration played its part—but mainly, I think, because the art of nuclear weaponry had not yet progressed to the point where long range ballistic missiles appeared to be feasible; and since propulsion has always been simultaneously the key and the bottleneck to greater aircraft performance, when handed an improvement in propulsion, we in the Air Force almost instinctively thought in terms of flying further, higher and faster. Consequently, space exploration seemed the logical way to go.

But about that time came the thermonuclear breakthrough, and it became rapidly apparent that there was a more immediate pay-off from our efforts in the rocket propulsion field. The Air Force mounted a tremendous, massive, all-out effort to attack the scientific, engineering, site activation and operational problems of developing and fielding a ballistic missile force. And so much of our talent, time and money were devoted to this task that, relatively speaking, we had little left to spend in pursuit of possible military applications in space.

In the meantime, NASA was formed and was charged by Congress to achieve certain national objectives. These were: "(1) to conduct the scientific exploration of space for the United States, (2) to begin the exploration of space and the solar system by man himself and (3) to apply space science and technology to the development of earth satellites for peaceful purposes to promote human welfare."

But Congress stated a fourth national objective, which was assigned to the Defense Department. It was, "to apply space science and technology to military purposes for national defense and security." It is this objective which, as an Air Force officer, naturally concerns me most; but, I think, more and more it must concern us all.

It seems to me that so far in the military space program we have been exploiting the obvious and solving what may prove to be, comparatively speaking, the easy problems. We have adapted and applied many of the techniques we learned in our ballistic missile program, and from many of NASA's programs, to perform a number of peripheral, or supporting missions—as opposed to purely military missions—that in some situations we can do better in space than we can from the ground; for example, such things as communications, navigation, geodesy and weather forecasting. There is nothing wrong with this approach—certainly you do those things that you know how to do—but none of these has had a direct or profound impact on our military strategy, or upon the ways in which we wage or prevent war.

I feel that the time is rapidly approaching when we must determine whether or not there are truly military

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Artist's Concept of Manned Orbital Laboratory (MOL).

## Patents, Proprietary Rights and Military Exports

by  
Mr. Ralph H. Jefferson  
Office of the Asst. General Counsel  
(International Affairs)  
Office of the Secretary of Defense

What have patents and proprietary rights got to do with military exports? The question is a reasonable one, for the latter term is most commonly understood in terms of sales of weapons, equipment and other hardware as such. In such transactions the question of ownership of the "industrial property" rights in the items will often be of little consequence. However, when a foreign government, while interested in a particular weapon or military item of United States origin, is unable or unwilling to purchase such item outright from United States sources, the subject of proprietary rights immediately takes on increased importance. It is a fair assumption that in coming years foreign governments will, for a variety of reasons, desire to have their own industries play a greater role in satisfying their defense requirements. They are likely to favor, increasingly, arrangements such as co-production of an item, involving participation by manufacturers in both countries, or straight licensed production in the foreign country. Both of these methods—as well as other variants—bring in their train all the problems regarding patents and proprietary rights which are necessarily involved in the transfer abroad of U. S. military technology.

It is therefore not surprising that in the last year or two increased attention has been focused upon the subject of "rights" as they relate to the basic goals of the United States military export program. Simply put, the question is: what is the best division of rights, as between the Defense Department and its contractors, in inventions and technical data and information resulting from research and development work performed under Defense contracts?

The answer is not an easy one. A definitive answer would logically depend in part upon a precise division of responsibilities between the Government and industry for carrying out the military export program. Unfortunately, precision in this regard is unattainable—and understandably so—in so complex and dynamic a program. We must be content with the more general assumption that, barring some drastic change in philosophy, both Government and industry have indispensable roles to perform if the export program is to enjoy continued success. The task, then, is to ensure that to the fullest extent possible the Defense Department's patent and data procurement policies respond to the needs of both Government and industry in fulfilling their respective roles.

With respect to patent policy, defense industry representatives have urged with considerable force that the Government should not under any circumstances deprive U. S. companies of the "rights" they need in order to enter into favorable licensing or co-production arrangements with foreign firms. When the patent policy section of the Defense Department's Armed Services Procurement Regulation was revised in the spring of 1964 to reflect the policy enunciated in a Presidential memorandum of October 1963, it was feared by some that the revision would result in a wholesale swing to "title-taking" by the Government. If the Defense Department took "title" to most inventions made under its research and development contracts, it was said, U. S. firms would be either unable, or—lacking incentive, unwilling—to obtain foreign patent protection; they would have less to license abroad, and no ready means of protecting what they did license; and foreign governments would be able to exploit freely the inventions in question without any benefit accruing to either the U. S. Government or industry.

The result feared was definitely not the one intended by the ASPR revision. To remove any possible doubts, a clarifying memorandum and some further revisions were issued in November of last year. These steps served to ensure that proper recognition would be given, in de-

(Continued on Page 24)

# Appropriation of \$700 Million Provides Added Insurance to U.S. Fighting Man in Southeast Asia

Expenditures which will assure "a position of plenty—militarily" for U. S. Forces in South Vietnam were described by Secretary of Defense Robert S. McNamara in a memorandum released May 18 by the White House to explain how the \$700 million emergency supplemental appropriation for Southeast Asia will be spent. In releasing the memorandum the President said:

"As I have stated on numerous occasions, the entire resources of the Federal Government are available to assist our men in South Vietnam. Our soldiers, sailors and airmen have a blank check for the equipment they need to assist the South Vietnamese. We seek no wider war, but so long as American men are in South Vietnam, they shall have the very best support that this country can give them. The speedy action by the Congress on this appropriation is a testament to the support our men have from the American people."

The memorandum from the Secretary of Defense follows:

"You asked the Congress on May 4 to appropriate an additional \$700 million to meet mounting military requirements in Vietnam. Two days later Congress passed and sent you an additional appropriation for that amount as an emergency fund for Southeast Asia.

"When you approved this appropriation on May 7, you said 'This money will be spent for arms, for weapons of war, for helicopters, for ammunition, for planes, not because we want war, but because the aggressors have made them necessary.' . . .

"While our inventory for combat consumables, tactical aircraft and helicopters has been substantially increased, as the House Committee on Appropriations said on May 5 in reporting out the \$700 million supplemental appropriation favorably, 'a position of plenty—militarily—is to be desired in the light of world conditions.'

"To provide added insurance for our forces in Vietnam and to assure that we continue our 'position of plenty,' we intend to allocate the \$700 million as follows:

	Army	Navy	Air Force	Total
Procurement of Ammunition & Ordnance	\$117.9	\$135.9	\$115.0	\$368.8
Operations & Maintenance Expenses	46.6	56.2	49.8	152.6
Military Construction Projects	44.8	22.0	41.0	107.8
Procurement of Aircraft	8.7	32.0	14.0	54.7
Other Operating Items	—	4.9	11.2	16.1
 Total	 \$218.0	 \$251.0	 \$231.0	 \$700.0

"Procurement of Ammunition and Ordnance—\$368.8 Million. Although the consumption rate of combat supplies in Vietnam is still quite small in relation to our current inventories and to projected deliveries from future production, we believe it is prudent at this time to replace the stocks now being consumed in order to ensure that the planned build-up of our war reserve inventories continues. Accordingly, the \$368.8 million will be allocated to the procurement of those ammunition and ordnance items which are being consumed in Vietnam. Included in this category are 2.75 air-to-ground rockets, 7.62 mm and 20 mm cartridges, a variety of modern, aircraft-delivered bombs, aircraft flares and other illuminating devices, bomb racks, gun pods and ordnance handling equipment.

"Operations and Maintenance Expenses—\$152.6 Million. This money will be used to defray the costs of moving U. S. forces and their equipment and supplies to Vietnam and to support the increased overhaul and maintenance loads (including the procurement of additional spare parts) growing out of the more intensive use of and combat damage to aircraft and other equipment deployed in Vietnam."

"Military Construction Projects—\$107.8 Million. This money will be devoted to the construction of additional facilities required to support the expansion of U. S. military forces in Southeast Asia and to protect our men and equipment there. Facilities must be provided for the growing number of U. S. military personnel in that area and warehouses, shops and repair facilities must be constructed for the supplies and equipment. Port facilities and airfields must be improved to accommodate the increased flow of materiel and the growing number of combat aircraft. Additional petroleum storage, transportation and dispensing facilities must be provided for the increased inventories of aircraft and the higher levels of operations. This money will also be used to construct hospitals to serve our men in South Vietnam.

"Procurement of Aircraft—\$54.7 Million. Aircraft attrition rates in Southeast Asia have been lower than the attrition rates during World War II and the Korean conflict and they are quite modest when compared with current inventories and production rates. Nevertheless, it would be prudent at this time to make the necessary preparations for higher production rates of selected aircraft should such production rates be required in the future. Accordingly, \$5.7 million will be utilized for the procurement of long lead-time components for such aircraft as the UH-1B helicopter, the F-4 fighter/bomber and the TA-4E fighter/bomber. The TA-4E aircraft are being procured to replace the A-4Es now being used by the Navy for training purposes. The acceleration of this program would release additional A-4Es for South Vietnam, if such aircraft are needed there.

"Other Operating Items—\$16.1 Million. The balance of the \$700 million—\$16.1 million—is required for a variety of other operating items, including some small, fast patrol boats, special tropical gear, communications equipment, etc.

"The allocation of the \$700 million as I have described will, in my judgment, fully meet our essential short-range needs. Nevertheless as you noted in your message to the Congress on May 4, no one can guarantee that 'this will be the last request'. I will continue to keep the situation in Vietnam under constant review and I will advise you of any additional needs in funds or equipment as soon as such needs arise. As you know, we have given our forces in South Vietnam first call on any of the resources of the Department of Defense."



The U. S. Army UH-1 Helicopter in Operation in South Vietnam.

# Guidelines for Developing and Submitting Unsolicited Proposals U.S. Navy

## Criteria for Determining Whether to Submit a Proposal.

Before any kind of a document is prepared in submitting an unsolicited proposal, consideration should be given to what might be called the "pre-proposal" stage of the operation. Since at this stage there is no certainty that financial support is forthcoming, it is appropriate that any preparatory work be limited to an effort which will require a minimum expenditure of funds. What should this effort encompass? First, the company should sort out the obvious technical barriers in its proposal and attempt to acquire sufficient technical data to indicate that they are subject to solution. On occasion, a company may propose research or development of an invention conceived independently of a Government contract but not yet actually reduced to practice (i.e., actually built and tested). If so, consideration should be given to the rights in the invention which the Government will acquire if the invention is reduced to practice under a contract. At the least, the contract will require the grant, to the Government, of a royalty free license to use the invention for governmental purposes. In some circumstances greater rights (including in some cases the grant of outright ownership) may be required.

## Preparation of Preliminary Proposal.

After the prospective contractor has assembled enough information to adequately describe a new or novel concept to indicate the approach necessary to solve the obvious technical problems and, if possible, to describe the ultimate military application, he is ready to prepare a preliminary proposal. The Office of Naval Research (ONR) publication, "Contract Research Program (ONR-1)," provides a guide for the preparation of research proposals. The proposal guide therein was primarily designed for basic research; however, the general guidelines are also suitable for applied research/exploratory development. A more specific guide for applied research/exploratory development proposals might be:

1. One-page summary statement of the proposed work.
2. A definition of the military application or field of interest and some indication of performance increases which might result.
3. A summary of the state of the art in the area.
4. A reasonably complete technical description of the proposed work, including a specific work statement and relationship of the proposed work to other work in the same field.
5. Name(s) and background of principal investigator(s) and associate(s).
6. Estimated duration of project and yearly budget; including an estimate of cost of capital equipment and expendable supplies.
7. Facilities required and knowledge of availability.
8. Other Government-sponsored work in the same area being undertaken by the activity.

The preliminary proposal should, in general, follow the format described above with the exception that at this stage detailed information is not necessary for sections 6, 7, and 8.

## Processing a Preliminary Proposal.

The next step in processing a preliminary proposal is to determine the agency and individuals in that agency who might have an interest in the proposal. ONR has prepared a publication entitled "The Office of Naval Research Contract Research Program," which gives a general outline of the many scientific disciplines of interest to the ONR. The booklet also contains addresses and telephone numbers of the field organizations of the ONR. From these, one can obtain the names and telephone numbers of the particular scientist that would have cognizance of a field of interest. If the telephone inquiry suggested should fail to provide the necessary information, there

is a "Directory of Navy Small Business Personnel," which contains the names, addresses and telephone numbers of all Navy Small Business Specialists. These people are familiar with the total Navy picture and may be of assistance in establishing the initial contact. In the event basic research or development work is not involved in the proposal, there is a publication entitled "Selling to the Military" which lists all of the military establishments that generate requirements of any nature.

The next decision to be made is whether the preliminary proposal should be mailed to a Navy agency or a personal contact made to discuss the document. If it is at all possible, it is more advantageous to make one or more personal contacts to discuss the proposal with interested individuals. The conversation type proposal discussion makes it possible to obtain detailed comments and suggestions which are difficult or impossible to incorporate in correspondence.

One source of discouragement to the prospective contractor is the referral from one office to another in the search for the office or individual who is interested in the area covered by his proposal. This is often referred to as the "bureaucratic runaround" by individuals who don't understand the problem. The Navy and other military departments are large, complicated organizations consisting of central and field activities with various responsibilities and interests. The prospective contractor should accept the fact that in many cases it will require some effort to locate the office or individual who is in a position to evaluate his preliminary proposal.

In any review of a preliminary proposal, either by correspondence or office discussion, the prospective contractor should carefully note any specific technical objections or reference to lack of military application. It is usually pointless to prepare a final proposal if it does not contain sufficient information to contradict to some degree the objections noted above. Preliminary discussions often reveal information which may make it advantageous for the prospective contractor to slightly alter his original concept so that his work will more nearly conform with a military requirement of which he was originally unaware.

## Submission of a Formal Proposal.

After the preliminary proposal has been thoroughly reviewed the prospective contractor has to evaluate the results of this review to determine if he should submit a formal proposal. Many important questions must now be answered. Was there sufficient interest to justify the expense of a formal proposal? If the reviewing office indicated an interest, was there any reason to suppose that funds were available to support such an effort? Did the reviewing office suggest that the submission be delayed until the next fiscal year when funds would be available? If the concept has a military application, should it be submitted to the Navy Department or some other military department?

If the prospective contractor has now made a decision to submit a formal proposal, it is often satisfactory to use the preliminary proposal as the basic structure which is embellished with additional details. Excellent features of an unsolicited proposal may receive little attention if the technical information and format are not adequate to convince the prospective customer that the proposal is worthy of acceptance.

## Navy Evaluation of an Unsolicited Proposal.

Let's be more specific about the factors which influence the acceptance of a proposal; one of these is the arrangement of technical groups within a research organization. Scientific disciplines are well defined and an unsolicited proposal for basic research in a scientific area is usually reviewed by an investigator who is trained in the related discipline. This arrangement assists in processing basic research proposals. Occasionally, interdisciplinary proposals make their appearance but they are the exception

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# World-Wide Communications

## "In Seconds"

by

Maj. Gen. Richard J. Meyer, USA



Maj. Gen. R. J. Meyer, USA  
Commanding General  
U. S. Army Strategic  
Communications Command

The communications art today is in the midst of a vast revolution and expansion of user demands as well as of equipment development—a communications revolution and expansion that will change our entire way of living and working in the very near future.

As the tempo of our world steps up, the Army changes too, responding to the shock waves of evolution and revolution, not least in communication matters. Recently, very great changes have renovated the communications-electronics organization of the U. S. Army.

On March 1, 1964 the U. S. Army Strategic Communications Command (STRATCOM) was created in order to put all Army strategic communications nets and operating troops, wherever they may be in the United States or overseas, under one single major field command of the Army. Its mission: to manage, control and operate the Army's portion of the Defense Communications System (DCS) world-wide, and to serve as the single point of contact between the Defense Communications Agency (DCA) and the Army.

Today's Army is a world-deployed force. Its troops are positioned in force in overseas areas around the globe. And in the continental United States combat contingency troops are ready in two corps to move rapidly to any objective area—either as part of Strike Command or as a unilateral organization to undertake a special mission.

STRATCOM has supported exercises of the Strike Command in many areas—for example, in California last year in exercise DESERT STRIKE, where an air-transportable troposcatter radio system was furnished, providing 24 communications channels in 100-mile relay jumps. STRATCOM also conducted successful satellite voice communications tests from Dallas, Tex., through the Army-operated ground satellite communications station at Camp Roberts, Calif., up to the SYNCOM II satellite and back down to a transportable satellite ground station serving STRICOM. Thus, in a matter of hours, three distinct media of voice and records communications—namely, troposcatter, satellite and high frequency air transportable radio—were all employed, demonstrating STRATCOM's capability of supporting a commander with versatile, responsive, long-range communications.

STRATCOM headquarters exerts direct control over all strategic communications troops around the world. Control is exercised through five regional sub-commands: CONUS, Pacific, Europe, Mid-East and South. The first four sub-commands are well implemented now. The fifth, STRATCOM-South, is the newest major sub-command. It was established on the first day of February 1965 by converting a field office in Panama through which

STRATCOM supervised installations that were recently set up in a number of Central and South American countries.

Already STRATCOM's global responsibilities involve the command with a working force of at least 11,000 military and civilians in the United States and in more than 30 nations overseas.

Headquarters of the STRATCOM-CONUS subordinate command is located near Washington, at Suitland, Md. CONUS controls single sideband high frequency radio systems that connect with major countries overseas (supplemented by leased cable facilities to Europe, Latin America and Hawaii). CONUS possesses major modern relay centers, such as the East Coast Relay, a fully automatic message switch at Ft. Detrick, Md. STRATCOM has two other similar automatics: one at Ft. Leavenworth, Kan., and the other at Davis, Calif. In addition, there are a number of older, torn-tape switching installations serving temporarily at Camp Pickett, Fort Bragg, Fort McPherson, and Fort Sam Houston. Within CONUS major STRATCOM communications circuits are provided by leased commercial facilities, including both AUTOVON and AUTODIN—the popular automatically switched voice and digital nets that will soon expand overseas to tie into all major military headquarters around the globe.

In Europe, STRATCOM's subordinate command was activated on July 1, 1964, with headquarters near Heidelberg, Germany. STRATCOM-Europe already controls quite a complex of communications systems, with more to come. High frequency radio circuits reach from Pirmasens and Saran back to CONUS, and on to Leghorn in Italy, and to the Middle East. A new troposcatter system is presently being installed in Europe, linking France, Germany, Italy, Spain and the United Kingdom.

In the Middle East, at Asmara, Ethiopia, STRATCOM has a concentration of high frequency systems that radiate to the Caribbean and CONUS, to Europe, Turkey, India and the Philippines.

In Central and South American countries, high frequency single sideband radio provides the major means of communications. Quarry Heights, in Panama, is the focus of circuits connecting with CONUS. An important additional communications facility in the area is a multi-

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Operations Area of the U. S. Army ACAN Transmitter Primary Communications Station.

# DOD Establishes Program for Improved Management of Support Services

Secretary of Defense Robert S. McNamara has approved the recommendations of a special study intended to improve the management of the \$8 billion the DOD spends annually for support services, which includes dozens of varied functions from housekeeping services to the overhaul of combat vehicles. These services are performed by DOD personnel and on the basis of commercial or industrial contracts.

When the study was initiated on September 11, 1964, Secretary McNamara directed the study group to:

"Determine where greater use of contractual support would be a more economical means of performing commercial and industrial-type functions which are available on a competitive basis from private enterprise.

"Determine where the use of contract support should be terminated because the cost of such service is in excess of that of performing the service internally, or because the use of contract support may be inconsistent with military readiness objectives, or civil service laws and regulations."

The study was directed by a steering group, chaired by the Assistant Secretary of Defense (Installations & Logistics) and with other Assistant Secretaries and high Defense officials as members. Representatives of the Bureau of the Budget and the Civil Service Commission participated in steering group meetings. The staff which conducted the study consisted of military and civilian personnel from each of the Military Departments, under the leadership of Mr. Robert C. Moot, Acting Deputy Assistant Secretary of Defense for Logistics Services.

The first recommendations to be carried out involve the use of contract technical personnel services. The study concluded that the objectives of improved military readiness and economy can both be realized by a change in management approach. In particular, an immediate need exists to eliminate the use of contract technical personnel when such use is inconsistent with civil service laws and regulations.

Contract technical personnel are employees of industrial or commercial organizations who assist Defense personnel in the operation, maintenance and training requirements for weapons, equipment and systems. The study identified 7,000 man-years of

technical personnel services at an annual cost of approximately \$117 million. To the extent that such personnel become, in practice, a part of the Defense work force under the supervision of Defense personnel, their use is inconsistent with civil service laws and regulations which prescribe when Federal positions should be staffed through normal civil service procedures for filling Government jobs. Consequently, the Military Departments are now preparing detailed plans for the orderly conversion of contractual technical support effort to DOD in-house effort in cases where it is necessary or desirable to do so.

This conversion effort will not terminate the essential flow of technical data from Defense users to producers of equipment which is so necessary to future product improvement and performance analysis during the early operational phase of newly delivered equipments. Likewise, the recommendations of the report do not apply to field service representatives who as contractor employees provide liaison service between companies and Defense users of industrial products.

One additional aspect relative to the use of technical services is that, from the standpoint of military readiness, it is important to insure that Defense personnel become capable of operating and maintaining weapons and equipment deployed with operating forces at the earliest feasible time in the life cycle of the weapons. This is portrayed by the chart shown below which illustrates (1) the trans-

mittal of technical know-how from producer to user during the life cycle of equipments and (2) the augmentation of Defense in-house employment levels by the use of contract technical personnel. The chart provides a clear vehicle for posing the two questions which were considered in the study, i.e., (1) the management question as to when the cross-over should occur between user capability and contractor capability and (2) the legal question of the propriety of adding contractor personnel to Defense personnel at on-site Defense installations under Defense supervision for the purpose of maintaining, operating and instructing on the use of installed Defense equipments.

Secretary McNamara has directed that industry representatives be given an opportunity to review and comment upon applicable Defense directives and regulations concerning the use of contract technical personnel prior to their issuance, including continuing monitorship by the Defense Industry Advisory Council.

Other functional areas of the total \$8 billion annual support services budget will be reviewed progressively under the new program. The review will utilize cost guidelines developed during the study and should result in more efficient performance. Management emphasis will be added at the Pentagon with the establishment of a new directorate for Contract Support Services Policy in the Office of the Assistant Secretary of Defense (Installations & Logistics).

## COMPETENCE - AVAILABILITY ANALYSIS CONTRACTOR vs USER

### LIFE CYCLE

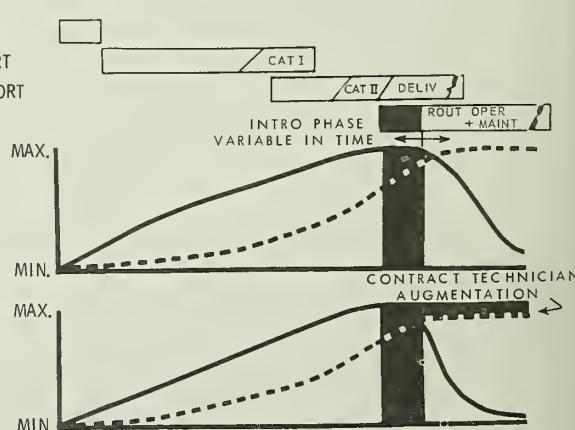
- PROGRAM DEFINITION
- PROTOTYPE SYS. EFFORT
- PRODUCTION SYS. EFFORT

### COMPETENCE LEVEL

### AVAILABILITY LEVEL

*Legend..*

- CONTRACTOR
- USER
- INTRODUCTORY PHASE
- CONTRACT TECH. AUGMENTATION



# DEPARTMENT OF DEFENSE

**Brig. Gen. James H. Weiner, Asst. Dep. Dir., Defense Communications Systems, Defense Communications Agency, has been assigned as Chief of Staff, Defense Communications Agency.**

**RAdm. John E. Dacy, USN, has been designated Senior Navy Member, Military Studies & Liaison Div., Weapon Systems Evaluation Group, replacing RAdm. Edward J. O'Donnell, USN.**

## ARMY

**Lt. Gen. Bruce Palmer, Jr., Dep. Chief of Staff for Military Operations, has been assigned as Commanding General, XVIII Airborne Corps, Ft. Bragg, N.C. He succeeds Lt. Gen. John W. Bowen.**

**Maj. Gen. Vernon P. Mock, Secretary of the General Staff, has been nominated for promotion to lieutenant general and assigned as Dep. Chief of Staff for Military Operations.**

**Lt. Gen. Charles W. G. Rich, Commanding General, Third U.S. Army, has been named Dep. Commanding General, Eighth U.S. Army, Korea. His successor as Commanding General, Third U.S. Army, is Lt. Gen. Louis W. Truman, formerly Commanding General, VII Corps, U.S. Army, Europe.**

## NAVY

**RAdm. Herschel J. Goldberg became Chief of the Bureau of Supplies & Accounts and Paymaster General of the Navy on April 30.**

**RAdm. Edward E. Grimm, Dep. Dir. for National Military Command Center, J-3, Joint Staff, JCS, has been assigned as Asst. Comptroller, Dir., Budget & Reports. He succeeds RAdm. Fred E. Bennett.**

**Maj. Gen. Alpha L. Bowser, Commanding General, Marine Corps Base, Camp Lejeune, N.C., has been nominated for promotion to lieutenant general and assigned as Commanding**

## Enterprise and Bainbridge Change Home Ports in October

**Two of the Navy's three nuclear powered surface ships will change their home ports later this year.**

**The attack carrier ENTERPRISE and the guided missile frigate BAINBRIDGE are scheduled to be homeported in Alameda and Long Beach, Calif., respectively, commencing October 1.**

**The present home port of the ENTERPRISE is Norfolk, Va. The BAINBRIDGE is now homeported in Charleston, S.C.**



## ABOUT PEOPLE

**General, Fleet Marine Force, Atlantic. He succeeds Lt. Gen. James P. Berkeley, who is retiring.**

**Maj. Gen. Richard C. Mangrum, Dir. of the Marine Corps Educational Center, Marine Corps Schools, Quantico, Va., has been nominated for promotion to lieutenant general and assigned as Asst. Commandant of the Marine Corps. He succeeds Lt. Gen. Charles H. Hayes, who is retiring. Maj. Gen. Paul J. Fontana is Gen. Mangrum's successor as Dir. of the Marine Corps Educational Center, Marine Corps Schools.**

**RAdm. Bernard F. Roeder, Asst. Chief of Naval Operations (Communications/Dir. of Naval Communications) has been nominated for promotion to vice admiral and assigned as Commander, Amphibious Force, Pacific Fleet, succeeding VAdm. John B. Colwell.**

**The following general officers of the Marine Corps have received new assignments as indicated below:**

**Brig. Gen. Raymond G. Davis as Asst. Chief of Staff, G-1; Brig. Gen. Keith B. McCutcheon as Commanding General, First Marine Aircraft Wing; Maj. Gen. Herman Nickerson, Jr., as Commanding General, Marine Corps Base, Camp Lejeune; and Brig. Gen. Ormond R. Simpson as Commanding General, Second Marine Division.**

**RAdm. Edward J. O'Donnell, formerly Senior Navy Member, Military Studies & Liaison Div., Weapons Systems Evaluation Group, has been assigned as Superintendent, U.S. Naval Postgraduate School, Monterey, Calif.**

## AIR FORCE

**Mr. Ralph R. Harding, former U.S. Representative of the 2nd District of Idaho, has been appointed Special Asst. for Public & Legislative Affairs to the Secretary of the Air Force.**

**Maj. Gen. Robert H. Warren, is being reassigned from duty as Superintendent, U.S. Air Force Academy, to Chief of Staff, Air Force Systems Command, effective Aug. 2. Brig. Gen. Joseph J. Cody, Jr., presently Chief of Staff, AFSC, will be assigned as Dep. Chief of Staff, Systems, AFSC, effective upon arrival of Gen. Warren.**

**Brig. Gen. Robert H. McCutcheon, will be reassigned from Dir. of Procurement Policy, Office of Asst. Secretary of Defense (Installations & Logistics), to Dir. Procurement & Production, Air Force Logistics Command, effective July 26.**

**Maj. Gen. Henry R. Sullivan, Jr., presently SACEUR Representative to the Joint Strategic Target Planning Staff, will become Deputy Commander, 2nd Air Force, Barksdale AFB, La., on Aug. 9.**

**Brig. Gen. Donald W. Graham, has been reassigned from duty as Dep. Chief of Staff, Materiel, Military Air Transport Service, to Commander, Eastern Transport Air Force, McGuire AFB, N.J. He succeeds Brig. Gen. Robert J. Goeway who has retired.**

**Brig. Gen. Gilbert L. Pritchard, Commander, USAF Special Air Warfare Center, Eglin AFB, Fla., has been assigned additional duty as Acting Commander, USAF Tactical Air Warfare Center, Eglin AFB.**

**Maj. Gen. Charles R. Bond, Jr., Dep. Commander, 9th Air Force, Shaw AFB, S.C., has been assigned additional duty as Acting Commander, USAF Tactical Air Reconnaissance Center, Shaw AFB.**

**Col. John D. Ludlow has been named System Program Director for the Advanced Manned Strategic Aircraft (AMSA). He is located at Wright-Patterson AFB, Ohio.**

## MTMTS Has New Headquarters

**Headquarters, Military Traffic Management and Terminal Service (MTMTS), has moved from its original location in Building T-7 to the Nassif Building, 5611 Columbia Pike, Bailey's Crossroads, in Fairfax County, Va.**

**The official mailing address remains unchanged:**

**Commander  
Military Traffic Management and  
Terminal Service  
Washington, D.C. 20315**

## AMC/SMC Relocation

**As a result of a regroupment effected in May 1965, Headquarters, U.S. Army Materiel Command (AMC), and Headquarters, U.S. Army Supply and Maintenance Command (SMC), are now both located in Building T-7, Gravelly Point, Va.**

**The Commanding General and various staff elements of Headquarters, SMC, which perform functions both for SMC and the entire AMC, have been moved from the Nassif Building in Arlington, Va., to Building T-7.**

**In view of the regroupment, it is recommended that defense industry representatives who plan to visit offices of AMC or SMC contact the appropriate command Information Office at the telephone numbers listed below for office location prior to their visit:**

**AMC Information Office — (Area Code 202) Oxford 7-8691.**

**SMC Information Office — (Area Code 202) Oxford 7-5687.**

# Youth Opportunity Campaign

## Launched by President Johnson

The President has called on industry to play an important role in the Youth Opportunity Campaign designed to provide employment for boys and girls out of school during the summer. The following is the statement of the President, relating to this program, released by the White House on May 23:

"Next month, in June, when school is out, over two million American boys and girls—16 through 21 years old—will look for work and won't be able to find it.

"Some of these two million will be looking only for temporary summer jobs. But getting those jobs may be the difference between being able to go back to school or not going back. I think it is good for America to put boys and girls to work in the summer when they really want to work—and bad for them when they are denied the chance.

"Almost a million of these young Americans will be trying to find their places in life, trying to become independent, self-sufficient. . . .

"We can, in my judgement, increase by at least half a million the work and training opportunities this summer for these boys and girls—in a way that is good for them and good business for all of us.

### **"A. The Federal Government's Role"**

"I am directing the Government departments and agencies to make every effort to find meaningful work or training opportunities this summer for one extra trainee for every 100 employees on their present payrolls.

- "This is to be done, for the most part, in the field offices and installations around the country.

- "These opportunities will be given, so far as this is practicable, to boys and girls 16 through 21 who need them the most because of economic or educational disadvantages.

- "There is a potential employment here of 25,000 trainees.

"I am also directing a re-allocation of Economic Opportunity Act funds to permit an extension of the Neighborhood Youth Corps program this summer to an additional 50,000 boys and girls.

- "Programs covering more than this number have already been submitted by local government and private non-profit organizations in all of the states.

### **"B. The Private Employer's Role"**

"I hope and believe that private employers will cooperate in this program.

- "There are 620,000 firms in this country which employ from 10 to 100 workers. I hope that at least half of these firms will agree to take on one extra summer trainee.

- "There are 60,000 larger plants, employing over 25 million people. If each of them will add one extra summer trainee for each 100 employees, this will mean another 250,000 trainees.

"I hope other large organizations—labor unions, trade associations, churches, colleges—will make a similar effort. This could mean another 25,000 to 50,000 trainees.

"This program will be well worthwhile only if it means extra work-training opportunities, over and above those which would normally be offered. It would be worthless, or worse, if this program only replaced regular employment opportunities.

### **"C. Task Force Appointment"**

"I am asking the Vice President to chair a Task Force to work out the details of this program. This Task Force will include representatives of the U.S. Department of Commerce, the U.S. Department of Labor, State and local governments, and business and labor organizations.

### **"D. Immediate Action Proposals"**

"In the meantime, and so this program can get started immediately, I am asking that these things be done:

1. That all private employers who are disposed to do so

make their own arrangements immediately for taking on one or more extra trainees this summer.

"If advice of this action, including the name of the trainee, is given by mail to the Secretary of Commerce, Youth Opportunity Campaign Unit, Washington, D.C., it will be appropriately acknowledged.

2. That all other private employers and organizations who are willing to cooperate in this program so advise the nearest State Employment office.

3. That all State Employment offices be advised, through the U.S. Employment Service, to establish special Youth Opportunity registers for this special summer program.

4. That all boys and girls 16 through 21 who want to work this summer and who don't have jobs get in touch immediately with the nearest Employment Service office. If this is difficult, write to the Department of Labor, Youth Opportunity Campaign Unit, Washington, D. C.

"It must be clear that we cannot and do not assure all boys and girls work this summer.

"We will do the best we can.

"In the depression of the 1930's we gave hundreds of thousands of boys and girls this kind of extra chance through the National Youth Administration.

"We acted then from the desperation borne of national economic distress.

"I ask that today, at the height of our prosperity, we act with equal magnificence.

"A boy or girl who wants a chance to work and who is denied it costs this country what it cannot afford.

"This is only one part of the broader attempt to assure full employment opportunity in America.

"The 16 through 21 year old group will represent, however, half of our unemployment next month.

"This is a special problem resulting from the entry into the work force this year of so many of the 'post-war baby crop.' It demands special attention."

## **Sec Def McNamara Orders Implementation of Youth Program**

Secretary of Defense Robert S. McNamara has ordered all Military and Department of Defense agencies to establish additional jobs this summer for young men and women as part of the President's Youth Opportunity Campaign.

Secretary McNamara, in a memorandum, said that the new jobs, for youths aged 16-21, should be established at the ratio of approximately one position for each 100 employees currently on the payroll, and shall be in addition to regular summer employment. There are at present approximately 1,000,000 employees on the payroll, hence approximately 10,000 new jobs would be created.

Positions such as helpers, which will provide both training and work experience, and positions in other unskilled and semi-skilled categories, which can be performed by young men and women, are envisaged for the program.

At most military installations there is significant maintenance work that has been deferred and which can be accomplished this summer by these boys and girls, Secretary McNamara said in his memorandum.

Persons hired under this program will be paid \$1.25 an hour, except in those instances when they are employed in a position for which a higher wage rate is appropriate under regular classification processes. Persons hired under the President's program can be appointed under a special Schedule A authority issued by the U. S. Civil Service Commission, or under other appropriate existing temporary appointing authorities.

Restrictions on these youths being employed by the same agency that employs his or her parents as a Federal employee will be observed, Secretary McNamara's memorandum emphasizes.



## JULY 1965

Annual Meeting and Technical Demonstration, July 26-29, at the Civic Center, San Francisco, Calif. Sponsor: Research and Technology Div., AFSC. Contact: A. J. Cannon (SEG) (SEE) Wright Patterson AFB, Ohio 45433, telephone (Area Code 513) 253-7111 ext. 35214

## AUGUST 1965

Tenth Symposium on Space and Ballistic Missile Technology. August 4-6, U.S. Naval Training Center, San Diego, Calif. Sponsor: USAF Space Systems Div. Conducted by Aerospace Corp. Contact: Dr. Charles T. Morrow, symposium director, Aerospace Corp., Box 95085, Los Angeles, Calif. 90045.

AIAA/ION Guidance and Control Conference, August 16-18, at Mayo Auditorium, University of Minn. Sponsor: Science & Technology Liaison Office, Air Force Systems Command. Contact: Capt. D. B. Hente (RTSAC) P.O. Box 8758, O'Hare International Airport, Chicago, Ill., telephone (Area Code 312) 296-4411 ext. 397 or 398.

Foundation of Computability (tentative title), August 25-27, at RADC, Bldg. 106 Auditorium, Griffiss AFB, N.Y. Co-Sponsors: Rome Air Development Center and Hughes Aircraft Co.

VII International Congress of the International Association Quaternary Research Symposia, August 30-September 5, University of Colorado, Boulder, Colo. Sponsor: Organizing Committee for INQUA, U.S. National Academy of Sciences. Contact: Mr. Walter H. Bailey, Division of Earth Sciences, National Research Council-National Academy of Sciences, 2101 Constitution Ave., N.W. Washington, D.C. 20418, telephone 961-1204.

Second International Symposium on Organometallic Chemistry, about August 30-September 4, at Madison, Wis. Sponsors: U.S. Army Research Office—Durham, University of Wis., National Science Foundation. Contact: Dr. Robert West, Dept. of Chemistry, University of Wis., Madison, Wis.

Conference on Comparative Neurophysiology, dates undetermined, at Tokyo, Japan. Co-Sponsors: Air Force

## MEETINGS AND SYMPOSIA

Office of Scientific Research and the Tokyo Medical and Dental University. Contact: Dr. H. E. Savely (SRL), Air Force Office of Scientific Research, Tempo-D, 4th St. & Independence Ave., S.W., Washington, D.C. 20333, telephone OXFORD (code 11) 6-4369.

## SEPTEMBER 1965

Symposium on Structural Adhesives Bonding, September 14-16, at Stevens Institute of Technology, Hoboken, N.J. Contact: J. M. Bodnar, Chief, Materials Research Branch, SMUPA-VP6, Picatinny Arsenal, Dover, N.J., telephone (Area Code 201) 328-3183.

1965 Semi-Annual Conference of the American Society of Photogrammetry, September 22-23, at Wright-Patterson AFB, Ohio. Co-Sponsors: American Society of Photogrammetry and the Research and Technology Div., AFSC. Contact: Mr. A. J. Cannon (SEG), Research and Technology Div., AFSC, Wright-Patterson AFB, Ohio 45433, telephone (Area Code 513) 253-7111 ext. 35214.

American Society of Photogrammetry, September 22-24, at the Sheraton-Dayton Hotel, Dayton, Ohio. Co-Sponsors: Aeronautics Systems Div., Research and Technology Div., AFSC and the American Society of Photogrammetry. Contact: J. R. Quick (MCLAE), Wright-Patterson AFB, Ohio 45433, telephone (Area Code 513) 253-7111 ext. 35167.

AF Industry Data Management Symposium, September 28-30, at International Hotel, Los Angeles, Calif. Sponsors: Ballistic Systems Div., (AFSC), DOD and Industry. Contact: Lt. Col. D. A. Cook (BSOM), Norton AFB, Calif., telephone (Area Code 714) 889-4411 ext. 8021.

Sixth Symposium on Non-Destructive Testing, September 28-30, at Sheraton-Dayton Hotel, Dayton, Ohio. Sponsor: Air Force Materials Laboratory, AFSC. Contact: Mr. Rowand (MAG), Air Force Materials Laboratory, Wright-Patterson AFB, Ohio 45433, telephone (Area Code 513) 253-7111 ext. 40209.

Third Symposium on the Plasma Sheath, dates undetermined, at New England Life Hall, Boston, Mass. Sponsor: Air Force Cambridge Research Laboratories. Contact: Mr. Charles E. Ellis, (CRDM), Air Force Cambridge Research Laboratories, L. G. Hanscom Field, Bedford, Mass. 01731.

## OCTOBER 1965

9th Annual Organic Chemistry Conference, October 5-6, at Natick, Mass. Sponsor: U.S. Army Natick Laboratories. Contact: Dr. Louis Long, Jr., Asst. Head, Organic Chemistry Laboratory (PRD), U.S. Army Natick Laboratories, Kansas St., Natick, Mass.

1965 Congress of the International Federation for Documentation (FID), October 7-16, at Washington, D.C. Sponsors: Air Force Office of Scientific Research, Office of Naval Research, Army Research Office, and National Science Foundation. Contact: Rowena Swanson (SRIR), Air Force Office of Scientific Research, Tempo-D, 4th and Independence Ave., S.W., Washington, D.C. 20333, telephone OXFORD 6-5374.

## NOVEMBER 1965

V/STOL Symposium, November 3-4, at Wright-Patterson AFB, Ohio. Sponsor: American Helicopter Society. Hosts: AFSC Aeronautics System Division, Research and Technology Division and Systems Engineering Group. Contact: Geo. Dausman, Wright-Patterson AFB, Ohio, telephone (Area Code 513) 253-7111 ext. 25104 or 23164.

4th Hypervelocity Techniques Symposium, November 15-16, at Arnold Air Force Station, Tenn. Sponsor: Arnold Engineering Development Center, ARO, Inc., and Denver Research Institute. Contact: J. Lukasiewicz, Arnold Air Force Station, Tenn., telephone (Area Code 615) 455-2611 ext. 7204 or 7205.

4th Annual Symposium on Physics of Failure in Electronics, November 16-18, at the Illinois Institute of Technology Research Institute. Co-sponsors: Rome Air Development Center and the Illinois Institute of Technology Research Institute. Contact: Joseph Schramp (EMERP), Rome Air Development Center, Griffiss AFB, N.Y., telephone (Area Code 315) FF 6-3200 ext. 2813.

All meetings listed are  
Unclassified

# CALENDAR OF EVENTS

July 1-4: 10th Mountain Division Association Reunion, Vail, Colo.

July 8-10: 4th Armored Division Association Reunion, Pittsburgh, Pa.

July 8-10: 82nd Airborne Division Association Reunion, Miami, Fla.

July 12-15: American Electroplaters Society Convention, New York, N. Y.

July 15-17: 3rd Armored Division Association Reunion, Los Angeles, Calif.

July 24: Ranger Aero Fair & General Aviation Education Day, Minneapolis, Minn.

July 24-25: 7th Annual Air Show, Erie, Pa.

July 25: Dawn Patrol Fly-In, Sturgis, Mich.

July 26-30: American Institute of Aeronautics & Astronautics Meeting, San Francisco, Calif.

July 31-Aug. 1: Air Show, Menominee, Mich.

Aug. 7-8: Sky-O-Rama, Baton Rouge, La.

Aug. 7-8: Cleveland Air Show, Cleveland, Ohio.

Aug. 9-11: Public Relations Society of American Convention, Denver, Colo.

Aug. 14: 20th Anniversary VJ Day.

Aug. 14-15: International Air Show, Abbotsford, Canada.

Aug. 15: American Institute of Aeronautics & Astronautics Air Display, Ontario, Calif.

Aug. 18-20: American Astronautical Society Convention, San Francisco, Calif.

Aug. 19: National Aviation Day.

Aug. 30-Sep. 5: American Meteorological Society Meeting, Boulder, Colo.

Aug. 31: Aerospace Day, Bartlesville, Okla.

Sep. 22-26: 20th Annual Convention of the National Defense Transportation Association, Detroit, Mich.

Oct. 4-17: PACIFIC CONCORD I, tactical air exercise involving units of the Royal Australian Air Force, the Royal New Zealand Air Force and the U. S. Air Force to be held in eastern Australia.

## Classified Advanced Planning Briefings Scheduled by AWC

The U. S. Army Weapons Command (AWC), Rock Island, Ill., will conduct one-day classified Research & Development Advanced Planning Briefings for Industry on September 21 and 23.

The briefings, co-sponsored by the Army Weapons Command and the American Ordnance Association, are expected to attract nearly 700 invited representatives from AWC's research and development selected bidders list. The industry representatives will be given formal presentations describing long range research and development plans and programs related to future military requirements of the Weapons Command.

The meetings will be held in the Administrative Center of Deere & Company, in Moline, Ill.

## Army Officers Receive Outstanding Management Training

The Army is constantly improving the management ability of its officers. One of the methods used involves participation by selected officers in management courses conducted by leading universities.

Typical of these courses are the Advanced Management Programs conducted by Harvard University and the University of Pittsburgh. These are training grounds designed to sharpen the abilities of outstanding executives from industry who ordinarily deal with top management problems of significant financial dimension and long-range business policy.

The Army has been enrolling officers in the Harvard program since September 1947 and in the University of Pittsburgh program since February 1951, and to date 282 officers have had the opportunity to complete this training. They have benefited by sharing the lessons of their own experiences and the experiences of the potential leaders of industry encompassing widely divergent backgrounds.

In a recent letter to Lieutenant General J. L. Richardson, Deputy Chief of Staff, Personnel, Headquarters, Department of the Army, Mr. Albert Frey, the Director of the Management Program for Executives, Graduate School, University of Pittsburgh, Pa., praised the outstanding contribution of the Army officers who have participated in the program.

"These men have been outstanding contributors to the success of our program . . . in two of the last four sessions the class president was from Department of the Army," Mr. Frey stated.

General Richardson says that the Army is fortunate to participate in and contribute to the programs of both Harvard and Pittsburgh, and is extremely pleased with the broadened outlook and knowledge the officer participants have gained from the experience. With the tremendous technological advances in industry and the concomitant impact on global strategy and weapons systems, it is imperative that our outstanding officers—possibly future generals—keep in step with new and improved management techniques. Participation in programs such as those offered by Harvard and Pittsburgh is one method used to insure that the Army's future leaders are constantly up to date.

## Mississippi Forms Association of Govt. Contractors

A U. S. Civil Service Commission sponsored conference was held recently in Biloxi, Miss., to discuss possible organization of a Mississippi Gulf Coast Association of Government Contractors to provide for equal employment opportunity in the area.

In addition to Civil Service Commission representatives, the conference was also attended by personnel from the President's Committee on Equal Employment Opportunity, the National Aeronautical and Space Administration, the Department of Defense Equal Employment Opportunity Program and businessmen from the Mississippi coastal area. In all, some six counties were represented at the meeting: Pearl River, Hancock, Harrison, Stone, George and Jackson. The proposed contractor's association would direct its efforts toward long range programs of equal employment opportunity in the counties.

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JUNE 1965

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JULY 1965

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15	16	17	18	19	20	21
22	23	24	25	26	27	28

AUGUST 1965

# SPEAKERS CALENDAR

## OFFICE OF THE SECRETARY OF DEFENSE

Hon. Cyrus R. Vance, Dep. Secretary of Defense, at U.S. Military Academy, West Point, N. Y., June 24.

Hon. John T. McNaughton, Asst. Secretary of Defense (International Security Affairs), at Brookings Institution, Washington, D.C., June 24.

## ARMY

Brig. Gen. Harry G. Woodbury, Dep. Dir. for Comprehensive Planning, Office of Dir. of Civil Works, at dedica-

tion of John Redmond Dam, Burlington, Kan., June 19.

Maj. Gen. Austin W. Betts, Dep. Chief of Research & Development, at Inter-Disciplinary Colloquia, Sandia Corp., Sandia Base, Albuquerque, N.M., June 28.

## NAVY

RAdm. William A. Brockett, Chief, Bureau of Ships, at National Assn. of Naval Technical Supervisors Conference, Honolulu, Hawaii, June 23; at launching of PLAINVIEW (AGEH-1), Lockheed Shipbuilding & Con-

struction Co., Seattle, Wash., June 28 (appearance only); at commissioning of PERTH (Australian ship), Boston Naval Shipyard, Boston, Mass., July 10 (appearance only).

Hon. Victor M. Longstreet, Asst. Secretary of the Navy (Financial Management), at Freedom Bell Celebration, Memphis, Tenn., July 5.

## AIR FORCE

Maj. Gen. Ben I. Funk, Commander, Space Systems Div., AFSC, at Society of Photographic Instrumentation Engineers meeting, San Francisco, Calif., Aug. 16.

## Office of Appalachian Studies Formed

The Army's Corps of Engineers has established an Office of Appalachian Studies (OAS) to undertake a comprehensive study of the water and related land resources of the Appalachian Region and to prepare a plan for putting those resources to work in stimulating economic growth in the region.

The study will be carried out in close cooperation with the Appalachian Regional Commission, a joint-Federal-State activity established under the Appalachian Regional Development Act of 1965 to form overall programs for economic growth.

The new Office of Appalachian Studies will have its headquarters in Cincinnati, Ohio, and will function as part of the Corps of Engineers' Ohio River Division under the Division Engineer, Brigadier General W. P. Leber. It will have a small staff of engineers, economists and other resources-planning specialists headed by Colonel John C. H. Lee, Jr. Its work will be closely coordinated with other departments and agencies, both Federal and State, engaged in the work.

The plan to be formulated by the OAS will embrace all or parts of 19 major river basins located within several Corps of Engineers Districts and Divisions, whose staffs will participate in the study in their respective areas. The studies will include engineering and economic surveys and will deal with such matters as recreation, flood control, water quality, water supply, navigation and the like.

## Group Formed to Study Procurement of Radios and Electronic Equipment

A study group to conduct a comprehensive analysis of the policies and practices in the procurement of radios and electronic equipment in Federal Supply Groups (FSG) 58 and 59 has been established in the Defense Supply Agency.

The study—scheduled to be completed by June 30, 1965—will include development of data relating to the operations of the Coordinated Procurement Program for all items in FSG 58, Communication Equipment, and FSG 59, Electrical and Electronic Equipment Components, managed by both the military services and DSA. The analysis and assessment portion of the study will focus on radios and associated components and parts in FSC 5820 and 5821.

The study was initiated at the request of the Assistant Secretary of Defense (Installations & Logistics) Paul R. Ignatius. In a memorandum of March 20, 1965 to the Military Departments and the Director, DSA, Mr. Ignatius stated:

"Recently it has come to my attention that each of the Military Departments procure radios of various types, and certain electronic equipment and components from the same manufacturers. The House Appropriations Committee has been critical of this arrangement and has pointed out several problems which arise from it.

"By this memorandum I am requesting the Director, Defense Supply Agency, to undertake a comprehensive analysis of our policies and practices in procuring radios of all types, and electronic equipment in Federal Groups 58 and 59."

## DSA Makes Advance Procurement Information Available to Industry

Defense Supply Agency (DSA) Centers are providing, or will in the future provide, estimates to industry of future procurements as part of a continuing effort to improve industry/DOD relationships.

The advance procurement information is released to all firms on the bidders mailing list concurrently and release of the information is announced in the Commerce Business Daily. Timing of the information releases depends on the inventory management system of the DSA Center involved and the nature of the items managed.

DSA Centers now releasing advance procurement information are:

Defense Clothing and Textile Supply Center  
2800 South 20th Street  
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# The U. S. Air Force Interest In Advanced Propulsion

by

Gen. B. A. Schriever, USAF

Propulsion is a pacing area of technology in the development of new aeronautical and space vehicles, as well as the true aerospace vehicles which are versatile enough to operate efficiently both within and outside of the earth's atmosphere.

Four areas of propulsion technology look particularly promising for further development: gas turbine technology; chemical rocket propellant technology; electric propulsion; and the supersonic combustion ramjet, or SCRAMJET.

## Gas Turbine Technology.

The gas turbine engine is already well proven on today's military and commercial jets. For the future, it offers real potential for efficient operation at widely divergent mach numbers and altitudes.

A leading feature of the gas turbine engine is flexibility, and strong efforts are being made to further increase this capability. Greater fuel economies and performance capabilities can be achieved by improving such component parts as the compressor, combustor, turbine and nozzle.

The turbine component is the heart of the gas turbine engine, and until now has been the major limiting factor. The high temperature and high stress loadings to which the turbine blades are exposed have limited current operating temperature to about 1700° or 1800°F. Recent advances in materials and cooling techniques have already allowed this temperature range to be increased considerably.

Improved gas turbines will be significant for future systems, such as the C-5A. The low fuel consumption required to give the C-5A its long range will be achieved by the use of efficient high bypass turbofans with increased turbine temperature capability.

Improved exhaust nozzle efficiency which is important for better engine performance is also possible.

## Chemical Rocket Propellant Technology.

A second area with potential for progress is chemical rocket propellant technology. Preliminary indications from our inhouse and civilian laboratories show that it is possible to develop new forms of very high energy chemicals with two or three times the energy potential of current propellants.

Several approaches exist that should raise the delivered specific impulse of storable liquids up to 330 seconds.

A significant increase in the specific impulse of chemical rockets might be achieved through the use of air augmentation.

Two forms of air augmented rockets currently interest the Air Force. One is the ducted rocket, which uses subsonic burning in a duct fed by fuel-rich exhaust gas from the rocket and by air from the atmosphere.

The second consists of a chemical rocket engine equipped with a nozzle ejector shroud. This system is referred to as the RENE cycle. This form of air augmented rocket can be operated with or without afterburning and appears to be able to operate efficiently over a very wide range of trajectory environments.

Solid propellant technology programs are advancing the capability of powerplants in terms of thrust size, energy content, and such operating characteristics as burn time, stop-start and variable thrust. A major benefit can be provided by the higher energy ingredients, especially light-metal hydrides in place of the aluminum powder currently being used as the fuel additive. The energy increase afforded by these new hydrides reflects a very substantial increase in payload capability for future missiles and space launched vehicles.

The space launch vehicles envisioned for the post-1970 time period—recoverable launch vehicles in particular—

pose a tremendous challenge to propulsion technology. Rocket engines producing much higher performance than that available from current engines will be required for recoverable aerodynamic type launch vehicles.

The high pressure, LOX-hydrogen rocket engine using a two-stage combustion cycle looks very promising in this connection. The Air Force Systems Command's Research and Technology Division, through its Rocket Propulsion Laboratory, has directed exploratory development programs in this area for the past three years. Progress has reached the point where a full scale prototype engine can be developed.

## Electric Propulsion Technology.

The third major area of propellant technology that appears very promising is electric propulsion. The potential thruster candidates include several efficient devices covering the specific impulse range of 500 to 10,000 seconds.

A distinct advantage of electric propulsion is the extended lifetimes that can be obtained. Present programs are aimed to extend lifetimes at increased performance levels. Such aspects of electric propulsion systems as power conditioning, feed systems and control systems are being researched to provide the technology necessary for a complete electric propulsion system. At the present time there is a joint USAF-NASA program to study the feasibility of a Solar-Electric Spacecraft for Planetary Probes.

One of the most promising applications for electrical propulsion systems is in attitude control and station keeping for near earth satellites. Electric propulsion can also be used for orbit changing. In the 1970 to 1980 time period electric propulsion systems may be developed to provide primary thrusting for deep space scientific probes and manned missions.

## Supersonic Combustion Ramjet Technology.

The fourth area of propulsion technology is the supersonic combustion ramjet, or SCRAMJET. A number of promising SCRAMJET approaches and applications have been studied for several years in laboratories and research facilities throughout the world.

The SCRAMJET is the most promising approach today for sustained hypersonic flight. It could make feasible the development of recoverable launch vehicles for flight speeds up to about 8,000 miles per hour as an initial step. Additional development can lead to speeds of about 17,000 miles per hour, which would permit the delivery of very large payloads into space at less than one-fifth the unit cost that is presently required.

The SCRAMJET has promising flexibility that would permit economical and efficient ranges in speed from 2,500 to 17,000 miles per hour. Thus it could be used effectively on hypersonic transport aircraft with both military and commercial applications. With SCRAMJET technology in hand it would be conceivable to bring New Delhi within about an hour's flying time of New York and at reasonable cost.

Propulsion is a pacing area of technology because the lead times involved can be very long. Naturally the advances that are achieved in the propulsion area need to be matched by advances in a number of other technical areas.

These advances can lead to really significant progress, both in aeronautics and in space. But this progress depends on the strength of our technology programs. We simply cannot postpone or delay these efforts. Those industries that push a strongly backed and aggressive program in propulsion technology today will have the lead in tomorrow's military and commercial applications.

## Major Crossroads in Space Program

(Continued from Page 2)

missions which can and should be performed in space. Before we can make that determination, we will need more fundamental knowledge than we have today. We cannot afford to make decisions based upon instinct or wishful thinking or so-called "common sense." The hard, scientific realities of space must be investigated, understood and profoundly appreciated before we can commit ourselves to any purely military missions beyond our atmosphere.

This is not to say that we don't know what our military responsibilities are in regard to space. These we have recognized with increasing clarity. We must avoid technological surprises; we must stay abreast of all scientific discoveries and technological advancements that may have military significance; and we must develop and maintain a capability to carry out in space any military mission which can be performed there more effectively, more economically, or more dependably than it can from the earth or in the air.

The big question mark in deciding how and where we can best provide our nation with the security it requires is MAN. We simply don't have enough experience as yet to say with any certainty what his abilities or limitations in space will be. There is urgent need for more basic knowledge of the near-Earth space environment and man's ability to operate in that environment. And I am convinced that the only way we are going to find out what man can and cannot do in space is to put him up there and require him to conduct some meaningful experiments. I mean comprehensive, carefully designed experiments to determine what he can do in space—not merely as a passive observer in a totally pre-planned flight, serving primarily as a sensor, or a monitor of sensors, but as an active participant who can use his powers of analysis and decision to alter the course of the investigations in such a way as to produce the maximum of verifiable and quantifiable data on man's abilities to survive, overcome and perhaps take advantage of the space environment.

I happen to be one who is convinced that we will find military missions which can best be performed by man in space—not just because I wear a blue suit and am conditioned to, and perhaps nostalgic for, man's active role in our nation's defense, but because history tells me that in every environment in which man has learned to live—on the land, whether it be in arctic or tropical climates, on and under the sea, and in the air—there have emerged valid military missions which man himself can best perform. Unfortunately, I can't prove that this extrapolation of history is valid, but neither can I be proved wrong, until we get men—not just one or two, but meaningful numbers of men—into space and determine what they can and cannot do to contribute to our military mission.

I believe the Manned Orbital Laboratory (MOL), as presently proposed by the Department of Defense, will enable us to come up with some of the answers. For the first time, we will be able to put military men in space whose primary interest will be in military missions. They will perform certain experiments that will let us know how well man can withstand the stresses resulting from the effects of long periods of weightlessness, confinement, isolation and radiation and meteorite hazards; and how effectively his senses operate, especially his vision and his manual dexterity while working inside and outside an orbiting space station.

MOL will also enable us to investigate in more detail the effects of space environmental phenomena on metals, materials, fluids and lubricants while under man's direct observation and control.

It will greatly facilitate scientific observations and experiments in the fields of astronomy, geodesy, bioscience and other areas which cannot be duplicated on earth.

Also, various operational techniques can be developed for such tasks as in-space maintenance and repair.

In other words, from experiments conducted in MOL by our astronauts, we hope to identify the militarily useful space missions which man will be able to perform.

I am convinced, however, that MOL is not going to provide us with all of the answers. As a matter of fact, it may provide more questions than answers, just as opera-

tion of aircraft at high altitudes and high accelerations did. We designed around those problems with oxygen systems, heated clothing or cabins and anti-G suits; but these engineering designs were the outgrowth of thousands of hours of painstaking, difficult and, sometimes discouraging, fundamental research. In the same way, MOL will tell us more about what happens in space, but it will take a great deal more sophisticated and fundamental research, both in space and in our laboratories here on earth, before we can understand *why* and *how* it happens.

We do not know about all the stresses man will be subjected to in prolonged space flight, but we can anticipate many of them: noise and vibration, g-loadings, weightlessness (which, if compensated for by some form of artificial gravity, the gravity may, in turn, produce other stresses), ionizing radiation, fear, prolonged states of alert, close confinement, use of reclaimed water and special foods, a recycled atmosphere, odors, temperature and humidity changes, restriction of physical movement, disruption of normal day-night and work-rest cycles, monotony, fatigue and loneliness. To what degree these combined stresses will affect his operations, how to reduce the effects, or eliminate them, and what other unpredicted stresses may occur, we have yet to learn.

This, then, is one clue, I feel, to the direction that our future space program must take—a greater emphasis upon a fundamental understanding of man himself and the environment in which he is to operate. I am not proposing that to do so we should reduce our emphasis on deep space exploration in the future—as a matter of fact, I contributed to and supported the decision to make a manned lunar landing the focus of our present program, because I was and still am convinced that this kind of a long-range goal gives any program a sense of direction and cohesiveness and viability. I am saying, however, that at the same time that we pursue these frontier explorations, we must continue to explore and investigate and try to understand the environment and phenomena of space in a more deliberate, fundamental and sophisticated way.

We are all conditioned by our experiences and background, of course, and one reason that I feel as I do is undoubtedly because this kind of fundamental research is the job of my present command, the Office of Aerospace Research (OAR). We are charged with conducting or monitoring basic research in those areas of science that seem to offer the greatest potential to Air Force interests. Much of this research is not related to the space program, but more than a little of it is. We are quite directly concerned with contributing to the solution of problems pertaining to space environment, communications, navigation and control, propulsion, re-entry, life support systems and many other topics that are of paramount interest to people in the space program.

(Continued on Page 24)



Artist's Concept of Man Operating in Space Environment.

## World-Wide Communications

(Continued from Page 5)

channel microwave system that runs the width of the isthmus.

The STRATCOM-Pacific subcommand was activated on November 3, 1964, with headquarters at Schofield Barracks on Oahu. On that date STRATCOM-Pacific acquired supervision over Army relay centers on Oahu, Okinawa, Taiwan, in Saigon and in Bangkok. On the same date also the extensive Pacific ionospheric scatter system was transferred from contractor operation to STRATCOM-Pacific. STRATCOM also operates major radio circuits westward from Hawaii.

To complete the picture, STRATCOM is also responsible for the operation of ground stations for the Defense Satellite Communications Program. The Army's Satellite Communications Agency (SATCOM) at Fort Monmouth has the job of all R&D for the ground environment, while STRATCOM is charged with installing, operating and maintaining the ground stations.

Two detachments of USASCC-CONUS troops, Detachments Nos. 10 and 11, continue to be deeply engaged in this newest mode of military communications—space satellites. Originally, from early 1962, they manned Army's first large fixed stations built for satellite communications—at Fort Dix, N. J., (Det. 10) and at Camp Roberts, Calif., (Det. 11). Here they pioneered in the art of communicating by satellite relay under a research and development program technically supervised by the U. S. Army Satellite Communications Agency in a joint DOD-NASA effort.

During 1964 teams of experienced STRATCOM operators from the two detachments went overseas to set up and man small transportable satellite communications stations located in Hawaii, the Philippines and elsewhere in the Far East.

All this suffices to show how significant and how fast growing are STRATCOM responsibilities and activities—not to mention important changes and new developments in Taiwan and in Korea. Neither has mention been made of some very important field commands of STRATCOM in the United States, such as the Joint Supply Command at Fort Ritchie, Md., the Interagency Communications Agency in the Washington area, the Radio Propagation Agency with headquarters at Fort Monmouth, and the 11th Signal Group at Fort Lewis, Wash.

In short, STRATCOM's responsibility is just about 100 per cent operations, seven days a week, 24 hours a day—moving traffic, getting installations up and systems in operation, testing and evaluating equipment and systems, developing experience (and skilled operators) in new ways of doing things, staying ahead in ideas of improvement and in new and better applications.

Strategic communications are fast being adapted to the requirements of this era of jet speeds and rocket weapons. Strategic communications must be *nearly as rapid* in the instant provision of communications as tactical systems. They must be *fully as transportable* as tactical systems, and they must certainly be *even more reliable* and must have infinitely *more capacity* than tac-

tical systems. The realities of military success, with or without missile intervention, demand quick communications that have absolutely no respect for distance or geographical location.

To cite an example, recently STRATCOM was asked to provide a special high priority circuit in an area halfway around the globe. The requirement was to be met, not in days, but in hours. Within 24 hours the transportable radio system, its security equipment, its installation and operating teams were all assembled and aboard an aircraft flying for the Far East designation. Thus it can be seen that strategic communications today must be capable of responding in an entirely different way than a few short years ago.

For this kind of quick reaction, this kind of contingency operation that requires strategic communications entry into the DCS, or extension of the DCS, in support of Army commanders, of missions assigned by the Chief of Staff or by the Joint Chiefs of Staff, STRATCOM does, in fact, possess a first line organization of troops and equipment.

The organization is the 11th Signal Group, a prototype unit tailored to execute these and other special and unique communications missions. The 11th is scheduled to have three large communications companies, one of which is now being equipped with a mix of the latest long distance transportable communications packages.

A flourishing strategic development of the DCS (in which Army communicators of STRATCOM made important contributions) is the switched circuit automatic network, or SCAN, now known as the first generation of DCS AUTOVON, the Automatic Voice Network. Working with the Bell Telephone Laboratories and with the Long Lines Department of AT&T, the Army in the early 1960's brought into being the initial automatic voice network of four switching centers. Subscribers use a touch-tone telephone handset to reach automatically any other subscriber in the network, or they may use a conventional phone to a switchboard which has lines into a nearby SCAN switching center.

The high-speed, high-volume data portion of AUTOVON is gradually being transferred to AUTODIN, the automatic digital network of the DCS, with the ultimate objective of restricting AUTOVON to voice (and low speed data) service. Thus AUTOVON is in the main a DCS network of voice communications.

In all these and many other on-going developments of the future, STRATCOM continues to support Army's portion of the DCS the world over.

"Support" is hardly the right word. It smacks of a static state of affairs, and present developments are obviously anything but static.

## Ad Hoc Group to Study Navy Procurement

An ad hoc group to study ways and means to improve Navy procurement planning has been established in the Office of the Chief of Naval Material.

The study charter—signed by Vice Admiral Galantin, Chief of Naval Material, on March 31, 1965—charges the ad hoc group with responsibility to develop "policy, procedural and organizational guidance required to integrate procurement planning with technical and financial planning in the weapon system development/acquisitions process."

The charter directs that prime emphasis be placed on "ensuring that procurement planning is formalized early enough in the overall planning cycle to support effective weapons system acquisition."

Admiral Galantin requested the ad hoc group, in conducting its study, to consult with appropriate Designated Project Managers and functional elements in the Naval Material Support Establishment.

Captain J. L. Howard, SC, USN, Assistant Chief of Naval Material for Procurement, is chairman of the ad hoc group.

Communications Team Assembles a New Experimental Satellite Link Terminal which is Capable of Communicating with a SYNCOM Satellite.



# FROM THE SPEAKERS ROSTRUM

## U.S. Navy Highlights

### DOD/NSIA Advanced Planning Briefings

This month's "From The Speakers Rostrum" features excerpts from the Navy addresses given at the regional DOD/NSIA Advanced Planning Briefings for Industry held during March and April in Los Angeles, New York City, Chicago, Dallas and Washington, D. C.

The Air Force presentations will be covered in the July issue of the Bulletin.

### U.S. Navy Advanced Planning Requirements



VAdm. I. J. Galantin, USN  
Chief of Naval Material

#### Office of Naval Material

. . . Because the Navy is anxious to insure that all who are qualified are afforded an equal opportunity to obtain Navy business, we have aimed our remarks toward the man who has had few dealings with the Navy. Our comments, we believe, also will be meaningful to those of you whom we already count as members of the Navy-industry team.

I'm going to invite four points to your attention:

- First, we should all understand how and why Navy requirements differ in nature from those of the other services.
- Second, you should know how the Navy is organized to do business.
- Third, I want to explain the missions of the Navy in terms which will help you make a "market analysis" of our needs.
- Finally, I'll call attention to procedures for entering the Navy contracting arena.

To set the framework of this review, I have to point out that the Navy material and equipment problem differs, in its basic nature, from those of the other armed services. The Navy deploys its surface, sub-surface and airborne systems from the polar regions of the globe to the tropics, and from outer space to the deepest depths of the oceans.

- Our submarines operate under the Arctic ice pack.
- The task force in Antarctica is a Navy unit.
- The project for moving farther into "inner space"—the deep ocean—is a Navy program.

- The Navy is also concerned with outer space, and relies on satellites for communications, navigation and weather surveillance.

This summary emphasizes the fact that Navy warfare systems encounter extremes across the total spectrum of:

- Temperature.
- Water pressure.
- Sea motion and explosive shock.
- Aerodynamic heating.
- Salt water corrosion.
- Space radiation.
- Other similar physical forces.

I mention these aspects of Navy systems to explain that, as a Navy contractor, you may encounter unusual specifications. But stringent contractual requirements make good sense when viewed from the perspective of the demands which might be made on the product, as well as from our outlook as taxpayers eager to get the most for our defense dollars.

. . . Now—how do you do business with the Navy? Fundamental to the answer of that question is knowledge of how the Navy is organized to do business with you.

The part of the Navy which is concerned with providing logistical support for the operating forces of the Navy and Marine Corps is called the Naval Material Support Establishment. As Chief of Naval Material I command that organization.

The Naval Material Support Establishment consists basically of four material bureaus: The Bureau of Naval Weapons, the Bureau of Ships, the Bureau of Supplies and Accounts, and the Bureau of Yards and Docks.

Of \$9.4 billion appropriated for Fiscal Year 1965 logistics support, \$4.4 billion goes to the Bureau of Naval Weapons.

The Bureau of Ships is obligating in Fiscal Year 1965 some \$1.8 billion in building 49 new ships, including 16 new anti-submarine destroyer escorts. This bureau also will spend considerable sums—about \$1.1 billion—for procurement of ship related material and for support of fleet operations.



A Polaris Submarine Under Way.

The Bureau of Supplies and Accounts appropriations average about a quarter of a billion dollars, which will be spent for purchase of goods and services needed at naval installations, and for food, clothing and other general supplies.

The Bureau of Yards and Docks, the Navy's oldest bureau, will supervise the expenditure of this year's appropriation of about \$400 million for the operation and upkeep of naval stations, and \$250 million of military construction money.

... How does the funding and financial process tie in to the missions of the operating forces? The main "torque converter" between the programming and budgeting system and the fighting forces is the Five Year Force Structure and Financial Program. . . .

Let us look at trends within three of the programs, and see how these trends affect the Navy.

Program One of the Five Year Force Structure and Financial Program supports Strategic Retaliatory Forces. The Navy part of this program consists of our Fleet Ballistic Missile submarines.

... While the annual trend is downward, two aspects of Program One are tending upward. The cost of operation is increasing, as more submarines spend more time at sea, and the cost of research and development is rising.

A major portion of the increasing costs result from the development of Poseidon. Poseidon will cost about \$900 million for development, and about \$1.1 billion for production and installation.

If experience with Polaris is an indicator, (and I think it is), the sub-contracting opportunities in connection with Poseidon will equal about 50% of the total program cost.

Except for the Fleet Ballistic Missile Forces, the bulk of the Navy and Marine Corps are part of the General Purpose Forces which are supported under Program Three. Navy elements of the General Purpose Forces will absorb about \$9.1 billion during this Fiscal Year. The trend into next Fiscal Year increases slightly; about \$9.55 billion are programmed for Navy and Marine Corps General Purpose Forces in Fiscal Year 1966.

General Purpose Forces can be best identified by their missions. Attack carriers and their embarked air wings, for example, have the basic mission of Strike Warfare. Many of you are interested in aviation, avionics or other air-oriented endeavors. Our general outlook is for expenditures in this area to continue at approximately their current levels. We are also satisfied that manned aircraft generally and carrier-based aircraft in particular have bright futures.

A second major mission carried out by General Purpose Forces is Anti-Submarine Warfare. . . . In the Anti-Submarine Warfare field, the problem is no resources. In Fiscal Year 1965 we will assign \$2.152 billion to Anti-Submarine Warfare. No major fluctuation in this figure is anticipated in FY 1964. We have enough money. What we need are technical solutions to the problems of detecting, classifying and localizing enemy submarines.

A third mission of the Navy, supported under Program Three, is Anti-Air Warfare. Studies leading to the possible development of a new advanced surface missile system are now under way. . . .

Amphibious Warfare is a fourth mission of the Navy and Marine Corps. Large numbers of new amphibious type ships are being built, not only because a sizeable proportion of the existing amphibious ships are approaching obsolescence, but also because the techniques of Amphibious Warfare are changing.

It should be noted, in connection with Amphibious Warfare, that the United States Marine Corps figures prominently in the financial planning of the Department of the Navy.

Among the warfare systems of special interest to the Marine Corps are several, now under development, which will enter the funding picture on a sizeable scale during the next few years. Perhaps some of you will have a direct hand in the development and building of:

- a. New high speed amphibious and landing craft.
- b. V/STOL assault aircraft.
- c. Longer range, lighter weight, more effective Naval gunfire and missile support weapons.

d. All-weather system for controlling the ship-to-shore movement.

. . . The sixth segment of the Five Year Force Structure and Financial Program deals with research and development. Of particular interest among the systems now being developed is one which promises to make major contributions to man's ability to exploit the sea, both militarily and economically—the Deep Submergence Systems Project.

The Deep Submergence Systems Project was created to meet four specific requirements:

1. Location of stricken submarines and rescue of their crews.
2. Search for and recovery of small objects down to 20,000 feet (incidentally, this depth covers 98% of the ocean floor).
3. Salvage of submarines or ships on the continental shelf, and development of equipment for salvage work at still deeper depths.
4. Expanding man's capability for working in the sea.

This project was recently established by the Navy and industry was briefed on it last November by the Special Projects Office, which is charged with its management. Like most systems in the early developmental phase, the Deep Submergence Systems Project is now funded on a relatively modest scale. Over the next five years the Navy plans to spend at least 200 million dollars in the "ocean engineering" aspects of deep submergence.

. . . As those of you who work with the Navy already know, developing Navy business is a lot like developing any other kind of business.

Step one in earning this business is to match your capabilities with our needs. Analyze the market and decide what part of it is of interest to your firm.

Step two is to get on the Bidders Mailing Lists.

Step three is to follow through aggressively. If you have a proposal, write it down and send it to us. We are anxious to have your proposals. Send them either to the appropriate bureau chief or to me.

I might point out that nothing substitutes for a reasonably brief, well considered, written proposal. Many persons who have good ideas try to sell those ideas orally, but usually this doesn't work too well.

We have to route new proposals between all the cognizant offices. Personal contact can't speed up or substitute for the kind of analysis our staff gives each new proposal.

Along this line, I assure you that you will get an answer as promptly as possible. It may be a positive answer, it may be a qualified positive answer, or it may be a negative answer. Our policy is to avoid unnecessarily prolonged decisions. If the reply is negative, you will be free to assign your resources and efforts to more promising areas. We won't leave you dangling on the hook.



New High Speed Amphibious and Landing Craft.

It has been a pleasure to review Navy business possibilities with you. No one knows better than those of us who are responsible for logistics support of the fleet that Naval power is rooted in the scientific and industrial competence of our nation. We appreciate your interest and solicit your support.

## Bureau of Naval Weapons



RAdm. E. E. Christensen,  
USN  
Asst. Chief for Plans  
and Programs  
Bureau of Naval Weapons

... The mission of the Bureau of Naval Weapons is two-fold. It must provide the Fleet with superior weapons systems, and it must provide the support required to keep those systems operating.

The Bureau's responsibility for a weapon system covers the entire life cycle from the inception of research and development until its final withdrawal from service. This includes the design, development, manufacture and, finally, the delivery to the Fleet of a fully operational system. While in service, the Bureau has the responsibility for the direct costs of operations and maintenance, including overhaul and modification.

To accomplish its mission, the Bureau of Naval Weapons has an annual budget of about \$4.5 to \$5 billion.

The Bureau's interests in the fields of aviation and ordnance are legion. They range from aeronautics to aircraft; from missiles to bullets. The catapults, arresting gear, fire control radars, directors and ASW equipments are all in our area of responsibility.

### ... First, manned aircraft.

We see no letup in the demand on the Navy's carrier striking forces. Consequently, we will continue to look for improved aircraft performance for strike, reconnaissance and close air support missions.

We seek new missiles—as our opponents acquire higher performance aircraft and missiles, we must improve the protection for our fleets. We will need higher performance missiles as well as superior interceptors capable of destroying enemy missiles, aircraft, or spacecraft.



U. S. Marine Corps A4D Aircraft Operating from Aircraft Carrier USS ESSEX (CVA-9).

We will increase our use of space technology to improve the Navy's capability in navigation, mapping and surveillance, and in developing systems to counter efforts to degrade the effectiveness of our naval task forces.

As submarines go deeper and run more silently, our ASW problems will become more difficult. The volume of the sea to be searched increases as the submarine operates at greater depths. The job of detection equipments will become even more difficult, and will require extended range ASW weapons of much greater effectiveness and accuracy.

In amphibious warfare, improved helicopters and fire support capabilities are required to back up the Marine Corps in landing operations.

... Next, I will indicate some of the major projects on which we are working, or considering, to meet these requirements.

For the next generation aircraft: in carrier-based types, we are interested in an all-weather attack aircraft, possibly using vertical take-off and landing techniques; an airborne early warning aircraft with greater effectiveness and less susceptible to detection and countermeasures; and an ASW aircraft having hovering capabilities as well as high speed and good range and endurance. We will require an advanced jet trainer and a new mission support aircraft.

In vertical take-off and landing investigations, as with helicopters, we are participating with the other services in several programs to investigate the potential of various techniques.

The X-22 V/STOL program is Navy sponsored and features the dual tandem ducted fan concept.

The NH-3A is a high speed research compound helicopter in which we are investigating the behavior of helicopter rotors at forward speeds in excess of those currently attainable with conventional helicopters. This is a Navy managed program jointly funded by the Army.

We foresee the helicopter being used in a wider variety of missions in the Navy. In addition to the uses which I have mentioned earlier, we may need a small manned ASW helicopter carrying both sensors and weapons which can operate from the deck of a destroyer.

... Airborne electronics and their support have grown so complex that we must now integrate the electronic subsystems in the aircraft. Three such systems coming up in the future are IHAS (Integrated Helicopter Avionics System), ILAAS (Integrated Light Attack Avionics System) and A-NEW (Airborne ASW Command and Control System). All three use modular systems, digital computers and micro-electronics. Both IHAS and ILAAS will use a test system being developed called VAST (Versatile Avionics System Test). The test equipment also is modular and computerized.

IHAS will be used initially to give the CH-53 Marine assault helicopter all-weather capability for vertical assault and logistic support. It is planned to incorporate ILAAS in the A7 attack aircraft in 1967.

A-NEW is being developed for airborne ASW command and control. It will integrate electronic and operational



Attack Aircraft Carrier USS Kitty Hawk (CVA-63).

functions to provide air crews automatically with solutions to ASW search and attack problems.

In surface launched missiles, we are working on the design of a standard missile to replace Tartar and Terrier.

. . . We are studying a short-range "point defense" missile system for use on the smaller combatant ships, and on auxiliary and amphibious types to give them a better air defense capability.

In the airborne missile field, the Phoenix system is being developed for the F-111B; and we are working on the electro-optical (or TV-guided) air-to-surface missile, Walleye.

In conventional ordnance, we are working on a 5" light-weight automatic gun, on rocket-assisted projectiles, an extended range ASROC, improved torpedoes, mines and free-fall weapons tailored for specific combat tasks.

. . . A very important area of research involves the improvement of power plants. There has been great progress in reducing the fuel consumption of the turbojet engine over the years, and this can be expected to continue. Taking a brief look into the future, a regenerative turbofan is a distinct possibility for providing another step in reduction of fuel consumption. Such an achievement would permit a sizable decrease in the weight of an aircraft for the same endurance, or an increase in the endurance for the same weight aircraft.

. . . Needless to say, there are problem areas where we need the help of industry in providing solutions.

The most pressing problem in weaponry is that of target acquisition and identification.

The best overall airborne short-range target acquisition system for surface targets still remains the pilot's unaided eye. We are working on forward-looking and high resolution radar, infrared and electro-optical techniques in an effort to solve this problem.

In the acquisition of air targets, from both ships and aircraft, we need better means of identifying the number of targets in a raid at long ranges. Of equal interest is more timely acquisition of low flying targets.

In both shipborne and airborne radar, we must develop techniques for acquiring and tracking targets in an environment of heavy electronic jamming.

In airframe technology, we are concerned with the special problems of aircraft launch and recovery aboard carriers.

We need methods for predicting structural fatigue and for monitoring the effects of individual hard carrier landings so that damage can be assessed prior to the next flight.

. . . Having covered our R&D areas of interest, let us turn to the budget and procurement.

. . . Overall, there is an increase of over \$300 million in procurement.

Well over a half-billion dollars of FY 1966 funds will be spent on these weapons systems:

- A7 Attack Aircraft
- A6 Attack Aircraft
- Torpedo MK 46
- Dash
- Snakeye

For operations and maintenance, the budget is increased about \$60 million over fiscal year 1965. FY 1966 funds will support 7200 Navy and Marine Corps operating aircraft as well as the Bureau's shore installations. These funds pay for such items as aircraft fuel and oil, and for the repair and overhaul of naval aircraft and ordnance.

. . . Within the FY 1966 budget, approximately \$170 million will be applied to exploratory development in such areas as:

- Airborne Sonars
- Aerial Navigation
- Underwater Guidance and Control
- Weapons Fire Control
- Guided Missiles
- Astronautics

About \$250 million of the budget will go into operational systems development of new weapon systems and improvements to existing systems.

. . . Barring unforeseen developments, we expect that the Bureau's total budget will continue at a level of about \$5 billion for several years.

Now that I have discussed some of the monies that we will spend—

How can one obtain information on the requirements of the Bureau of Naval Weapons?

Many of you are familiar with the R&D Clinics which we hold periodically, and many of you work with us in associations such as the NSIA. In addition, we provide considerable written material to industrial scientific groups under our long-range scientific and technical planning program. . . .

To advertise our procurement needs, the Bureau utilizes the Department of Commerce Business Daily to the maximum extent possible consistent with security considerations.

Additionally, many thousands of parts and stock for inventory are purchased through field procuring activities such as the Aviation Supply Office in Philadelphia and the Ships Parts Control Center in Mechanicsburg, Pa. Shopping lists of items purchased by these offices and items for which we are seeking new sources are also available. . . .

We recognize that we can fulfill our mission only with the full cooperation and support of the industry team.

We solicit your ideas and your proposals. These, and any questions that you may have, can be addressed to the Chief, Bureau of Naval Weapons, Navy Department, Washington, D. C.

## Bureau of Ships



RAdm. J. A. Brown, USN  
Asst. Chief of Bureau  
of Ships for Design,  
Shipbuilding & Fleet  
Maintenance

The mission of the Bureau of Ships is to create and care for ships needed by the Navy's operating forces. We conceive, design, build and maintain the ships. We are concerned with everything from complete computer systems to the simplest type of housekeeping equipment. In addition to providing for the needs of the Navy and the Marine Corps, the Bureau of Ships procures ships and boats for the Army, the Air Force and for foreign countries under the Military Assistance Program.

. . . In research and development we cooperate with the Chief of Naval Research and the Chief of Naval Development in sponsoring a significant amount of work directly related to ship design.

*Ship Design and Procurement*—In the design of ships, as in our R&D efforts, we share the workload with you. The Bureau of Ships Headquarters Establishment and Field Activities have a significant capability to prepare their own designs, both of the ship itself and of the shipboard equipment. While we think we are second to none in the field of warship design, we have great respect for the competence of commercial ship design firms and expect to continue to depend upon them for approximately half of our ship design work.

Procurement of the ships themselves is handled by our Headquarters in Washington. The procurement of major quantities of components and systems for ships built by our Navy is shared between Headquarters and our Field Activities.

The third major area of responsibility—that of fleet

*maintenance*—is controlled by Headquarters and accomplished by our Navy Yards and Industrial Managers. They, in turn, depend upon you for parts and raw materials required to overhaul and modernize our ships.

The fourth area is *technical and material support of ships*. In addition to providing support while ships are in overhaul, we must provide a large volume of material for shipboard use. The Bureau of Ships portion of this task is concerned with the technical items. The Bureau of Supplies and Accounts and the Defense Supply Agency procure the common non-technical items.

... In the research and development area we will spend or obligate \$295 million. In shipbuilding, which includes new construction and conversion, we will obligate \$1.820 billion, and in support of our fleet the Bureau of Ships contribution is \$1.94 billion.

... For purpose of advanced planning, what are our future trends?

The general trends in ships that may bring significant changes in our work are: First, the need to send our submersibles—both warships and research craft—to ever increasing depths. Second, the Navy's need to find vehicles capable of reasonably high carrying capacity and truly high speed, up to 100 knots. Third, a continued uprating of ships of the same type we are building today.

The search for greater depths and higher speeds emphasizes the need for higher strength and lighter material for ships' hulls. Investigations of improved steels, titanium, aluminum, glass reinforced plastics, and even solid glass will result in the use of increasing quantities of these materials.

Our efforts to develop practical ships in the 30 to 100 MPH category are centered about new hull forms. We will continue to develop hydrofoil ships. . . .

Research and development of ground effects machines will attempt to increase the size and seaworthiness of this hull form.

Closely related to these projects is the Marine Corps Amphibian Development Program. We need faster, lighter assault vehicles and Amphibious Support Vehicles capable of carrying 10,000 pound payloads at speeds of 30-35 knots. . . .

What are we buying in terms of types and quantities of ships? FY 1965 finds us in an era, as many of you know, of large procurements of amphibious warfare ships and auxiliary type support ships. Faced with block obsolescence of our World War II support ships, we are replacing some and creating new prototypes of others. At the same time, we are performing major conversions of World War II ships to extend their lives and allow a more orderly replacement program the next time around.

This program continues into FY 1966, changed to some degree, but with no major shift of emphasis.

... Now, to approach the future from another aspect, we can examine the principal systems in our ships. The trends identified here will be reflected in both new construction and in modernization programs.

In the field of electronics, the trend is to integration. The large number of tasks, the limited number of prime locations and the interferences between separate systems require integration of the ship's total electronics suit.

Specifically—in the field of shipboard radar—a single radar system which will provide all the radar functions is required. These functions may include search, detection, tracking, weapons designation, missile guidance and air control. . . .

System effectiveness for complete mission reliability will receive close attention. Electronics systems will be required to remain on the air, or ready for use, for long periods with little or no time allowed for repair of failures. Automatic fault location and back-up systems will contribute to this goal.

In the midst of increasing equipment complexity we must keep the human tasks down to reasonable levels. . . .

In the area of propulsion systems our trends will be toward increased use of gas turbines, increased automation of our propulsion systems and, further in the future, increased use of nuclear power.

... Automation in propulsion plants is now being incorporated in some ship designs. . . . Our objectives are the reduction of operating personnel and the improvement of reliability and operational capability. As we gain experience, we expect to automate other shipboard systems.

The Naval Nuclear Propulsion Program headed by Vice Admiral H. G. Rickover is a Joint Navy-Atomic Energy Commission effort to develop improved reactor plants. This program is studying plants in a wide range of power ratings for installation in ships, ranging from small submarines to large aircraft carriers.

One important project in this program is the development of a new type nuclear plant for a submarine. . . .

In the Nuclear Surface Ship Development Program, the Department of Defense and Atomic Energy Commission have decided to proceed with the development of a very high-powered, long life reactor for application to a two-reactor nuclear powered aircraft carrier. . . .

A third major area is that of cargo handling. In the interests of both efficiency of operation and reduced manpower, the trend will be toward increased mechanization in handling of all types of commodities. . . .

The requirements for amphibious operations demand that our ships have both a greater lift capability and a higher speed of unloading via both surface and air. In both amphibious and replenishment operations, we will also see a continued increase in the use of helicopters.

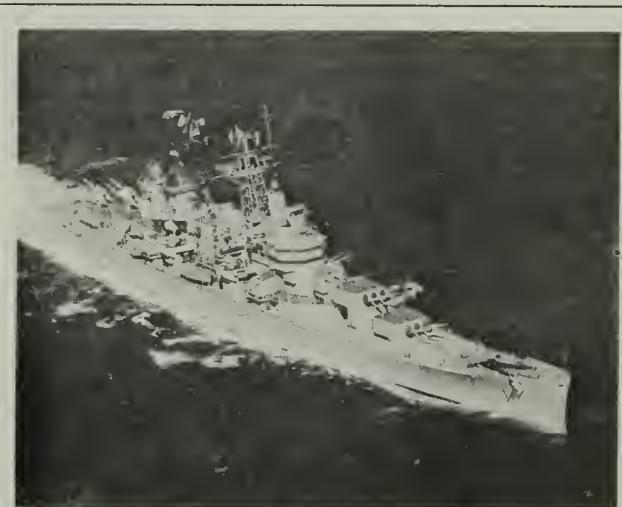
Now, for a few important trends that apply to ships and to ship systems.

The Navy's interest in controlling ship's noise—both to avoid detection and to improve our own sensors ability—will continue. Quieter ships are vital to our anti-submarine warfare effort, to submarine improvements and to our mine-sweeper program.

... A program of increasing importance to component manufacturers is our program to shock harden the combatant ships of the U. S. Navy. Our objectives in this program are to produce a ship which can absorb the blast and shock effects of nuclear and conventional weapons to at least the same degree as its human operators. . . .

Design work study is an analytical technique based upon simplification and method study techniques that all of you have utilized in plant operations. The primary object is to design a ship to require the minimum number of personnel and the minimum effort on their part for operation and maintenance.

Computers are already a vital part of our ships' system, and the use of computers is steadily growing in the design of ships. In the foreseeable future, ship design packages can include computer tapes suitable for direct



USS Boston (CAG-1) Under Way.

use by the shipbuilder in automated production operations such as plate cutting.

So far I have been talking of ships and the equipment which we expect to find in them in the future. I think you also will be interested in the manner in which we plan to obtain these items.

With the trend toward increased competition we have adopted two new methods for effecting it: Two-step formal advertising and multi-year procurement. Two-step formal advertising indicates, with a technical proposal, whether the potential bidders really understand the work. Then the second step, bidding, insures favorable prices to the greatest advantage in the procurement of electronics equipment, whereas the multi-year procurement method can be used for almost any items. . . .

Because we are already approaching the limit of complexity which the crews can maintain, we must increase the reliability and maintainability of future equipment. We are not just asking you to do this: Our contracts will require it.

Here are some of the steps which we will take in establishing this program.

We will consider reliability and maintainability early in the conceptual and design phases.

Specifications, product descriptions and contracts will include specific minimum requirements as one of the major engineering factors.

The contractor will have to demonstrate that acceptable levels have been met in the finished product.

The procedures for monitoring progress are not firmly established. They will be developed as we learn how best to obtain these two vital characteristics.

. . . In conclusion, we know that major advances in technology will continue, and that we need answers to lots of questions in that crystal ball. As Admiral Galantin and Admiral Christensen have said, we can always use new ideas and new talent. Let us have yours.

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## Navy Sources of Industrial Information

The new Naval Material Support Establishment comprises the Bureau of Naval Weapons, Bureau of Ships, Bureau of Supplies and Accounts and Bureau of Yards and Docks under the direction of the Chief of Naval Material, Vice Admiral I. J. Galantin, USN. These bureaus buy weapons systems, goods and services from private industry amounting to nearly nine billion dollars yearly and close to 95 per cent of Navy expenditures for procurement.

Fielding industry requirements for information related to these expenditures in the Office of the Chief of Naval Material, located in Room 1411, Main Navy Building, Washington, D. C. 20360, are the following:

Capt. Bernard S. Solomon, USN  
Public Affairs Officer, MAT 09D  
Telephone: OXFORD 6-4822 & OXFORD 6-3001

Cdr. Ted J. Bush, USN  
Asst. Public Affairs Officer, MAT 09D1  
Telephone: OXFORD 6-3001 & OXFORD 6-3312

Mr. Kenneth P. Borgen  
Industrial Information Officer, MAT 09D3  
Telephone: OXFORD 6-2493 & OXFORD 6-3907

Among other responsibilities, these individuals prepare and disseminate factual material on Navy business operations to contractors and technical journals; provide guidance to contractors on public information material and coordinate the security review; and approve and coordinate industrial information events such as Research and Development Clinics, Procurement Conferences and Advanced Planning Briefings for Industry.

## Repository for Canceled Specifications Established by DOD in Philadelphia

The Defense Department has established an archival service for industry on superseded military specifications and other standard documents required for contractual obligations. Canceled documents to be made available by this new archival service are those which are either listed in, or have been deleted from, the DOD Index of Specifications and Standards.

This repository will become operational on July 1 in conjunction with the Defense Single Distribution Point for Specifications at the Naval Supply Depot, Philadelphia, Pa.

For ease of handling and retrieval, microfilm will be used for storage and record of the canceled documents, thereby eliminating need for large volumes of old printed copies. Records of approximately 20,000 such documents are expected to be on hand on the opening date. This quantity probably will increase at a rapid rate since about 35,000 specifications and related documents are stocked and issued, a large proportion of which are continually subject to change to meet new requirements.

The archival service will provide, for the first time, a single source for copies of old specifications issued by all military services. There often are urgent demands for such individual documents which, even though not used for future procurement, still are effective on contracts which have been in progress for several years or which cover replacement parts in equipment used for a number of years.

The Office of Technical Data and Standardization Policy, of the Office of the Assistant Secretary of Defense (Installations and Logistics), is issuing procedures for use of the new service. These provide that industry requiring copies of canceled documents in fulfillment of contractual obligations may obtain these from the Director, Navy Publications and Printing Service Office (NPPSO-4ND), Philadelphia, Pa. Requests must be accompanied by a certification of the need by the appropriate contracting officers, who may submit requests directly to the above Navy office.

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## ARPA Selects Contractor For Project ALTAIR

The DOD Advanced Research Projects Agency, ARPA, has selected Sylvania Electric Products, Inc., of Waltham, Mass., to design, fabricate and install a new experimental radar on Roi Namur Island in the Kwajalein Atoll.

Designated Project ALTAIR (ARPA Long Range Tracking and Instrumentation Radar), the experimental radar will be used in conjunction with already operating instrumentation in the area. It is anticipated that the project will further increase the capability of Project PRESS to conduct studies of the physics of vehicles re-entering the earth's atmosphere. Project ALTAIR will be more sensitive and will operate at different frequencies than radars now in use in ARPA's ballistic missile defense research program.

The total funding of the project will approximate \$20 million, exclusive of military construction funds. Of this amount, Sylvania will receive initial funding of approximately \$12 million for the fabrication of hardware. Some portion of these funds will be utilized for subcontracting for the design and fabrication of certain components.

The project will be monitored for ARPA by the U.S. Army Missile Command at Huntsville, Ala. The Lincoln Laboratory of Massachusetts Institute of Technology, Technical Director of Project PRESS, will act as ARPA's technical consultant.

## San Bernardino AMA Phase Out Announced

Detailed plans for the phasing out of logistics operations at San Bernardino Air Materiel Area (AMA), Norton, AFB, Calif., have been released by the Air Force Logistics Command (AFLC).

This action is the first step in implementing the Secretary of Defense's directive of November 19, 1964, closing San Bernardino AMA. Phase I closing plans for Middletown, AMA, Olmsted AFB, Pa., and Mobile AMA, Brookley AFB, Ala., were announced earlier.

San Bernardino phase out differs from Middletown AMA and Mobile AMA in that Norton AFB is not scheduled to close. With AFLC activities moving from Norton, responsibility for the base operation will shift from AFLC to the Military Air Transport Service effective July 1, 1967.

The following is a list of major responsibilities to be relocated from San Bernardino AMA during the period July 1965 to December 1965:

### To Ogden AMA, Hill AFB, Utah:

- Materiel management and maintenance for Titan II (System Support Manager/Inventory Manager).
- Materiel management for Titan II Aerojet Engines (FSC 2845 A), Titan II (Weapon System Storage Site) and Titan III (System Support Manager/Inventory Manager).
- Maintenance for Titan II Trailers (FSC 2330), Gas Generating Equipment (FSC 3655), Lubrication and Fuel Dispensing Equipment (FSC 4930), Electrical Control Equipment (FSC 6110), Batteries (FSC 6140) and Gas Cylinders (FSC 8120).

### To Sacramento AMA, McClellan AFB, Calif.:

- Materiel management and support for P437 and Booster and Rocket Engine.
- Procurement for Atlas Boosters (LVIII), Titan I Boosters (LVIV), Atlas Rocketdyne Engine (FSC 2845-RA) and Special Procurement Projects.
- Materiel management and support for Judge Advocate General AMA Claims, Logistics Field Assistance, Supply Distribution Point Relocation (new procurements of C-133 aircraft spares to new location), B-45 aircraft and Management Engineering Function (portion).
- Maintenance for Precision Measuring Equipment Area Support.

## National Armed Forces Museum Planned

A National Armed Forces Museum, graphically depicting the accomplishments of the Armed Forces in war and peace, will be built on a 340-acre tract of land bordering the Potomac River at Fort Washington, Md.

In concept the museum would seek to inspire the public with a meaningful sense of the accomplishments of the Nation's Armed Forces, their contributions to national development and the role played by our people in providing the sinews of defense for maintaining a free, peaceful and independent society and culture in the United States of America.

The museum would feature a park complex with reconstructions of fortifications, earthworks, trenches and other military and naval facilities characteristic of memorable periods in our Nation's history. The park area would also have a ship basin in which to preserve and exhibit significant specimens of naval vessels.

A central exhibit building, specially designed to house large pieces of military equipment, would include a study center for scholarly research into the meaning of war and its effect on civilization.

A large parade ground would accommodate parades, tattoos, military reenactments and similar spectacles.

Portraying the Armed Forces' peacetime contributions would be displays in science, nuclear energy, terrestrial and space exploration, electronics, engineering, aeronautics and medicine.

## Dr. Hubertus Strughold Receives Aerospace Medical Award

Dr. Hubertus Strughold, chief scientist of the Aerospace Medical Division, Air Force Systems Command, is this year's recipient of the Aerospace Medical Association's Louis H. Bauer Founders Award. The award is named for the late Louis H. Bauer, the "father of aviation medicine," one of the Association's co-founders and first president. It is given annually for the most significant contribution in space medicine.

Dr. Strughold is often referred to as "The Father of Space Medicine." In 1949 he was placed in charge of the first full-fledged Department of Space Medicine at the USAF School of Aviation, which is now known as the Department of Bioastronautics, USAF School of Aerospace Medicine, Brooks AFB, Tex.

Under his guidance, the Department of Space Medicine began development of the medical groundwork for the man in space program, directing the first studies of the environmental problems of space cabins in the world's first space cabin simulator.

During 1928-29 Dr. Strughold performed research at Western Reserve University, Cleveland, Ohio, and the University of Chicago and then returned to Germany where he was born and educated. He came back to the United States in 1947 to join the staff of the School of Aviation Medicine, now the USAF School of Aerospace Medicine.

## Unsolicited Proposals U.S. Navy

*(Continued from Page 4)*

rather than the rule. Organizations which support applied research and exploratory development are not as sharply delineated as the basic research organizations and it is usually more difficult to find the cognizant group.

In addition, any proposal which has a military application should be based on a careful investigation of the following aspects of the work: Is the military application a new one or an improvement of current practice? If so, does it appear that the successful completion of the work will provide a technique or equipment which will substantially alter our military capability? Is it technically feasible to integrate the new technique or equipment with existing systems?

In other words, the prospective contractor who investigates the military aspects of a new concept can often decide for himself whether or not the idea is worthy of the expense of a formal proposal. Since the military specialist who processes the proposal follows somewhat the same procedure, he is at once impressed with a proposal which shows signs of having been prepared as the result of such an analysis.

Many applied research proposals are technically complicated and they extend the state of the art to such an extent that the final answers are available only after a meticulous investigation. On the other hand, a first look at some proposals immediately raises some questions which a prospective contractor should have been able to answer by a review of existing knowledge or a simple experiment. Any such information voids in a proposal are definitely a handicap to acceptance and any assumption is susceptible to rejection where there is doubt as to the validity of any of its components. It is not contended that the prospective contractor should undertake a research program before he submits a proposal, but it is definitely to his advantage to provide technical information to the extent that the reviewer can reject only on the basis of specifics.

One last item of the formal proposal which should be handled with care—the costs involved. With decreasing military budgets, good technical proposals with unrealistic financial figures are worthy of only verbal support and of no use to either the prospective contractor or the military.

In summation, the successful contractor in the applied research and exploratory development area is the one capable of producing new or novel military applications of research and technical information and processing the complete technical investigation at a reasonable cost.



# BIBLIOGRAPHY

DOD Instruction 4270.30, "Standards and Criteria for Permanent Construction—General," April 15, 1965. Sets forth basic guidance and criteria for the design of military facilities of permanent construction other than family housing.

DOD Directive 5010.4, "System/Project Management," May 4, 1965. Establishes DOD policy governing the use and application of System/Project Management.

DOD directives and instructions may be obtained from:  
Publications Distribution Branch  
Office of the Secretary of Defense  
Room 3B938 The Pentagon  
Washington, D.C. 20301

Armed Services Procurement Regulation (ASPR) Revision No. 11, June 1, 1965. Includes (1) updated Section I, Part 9, reflecting revised policy with respect to responsibility of contractors which was issued in Defense Procurement Circulars #3 and #9; (2) ASPR Appendix containing uniform procedures for conducting the pre-award surveys; and (3) DD Form which will be completed by Government personnel conducting pre-award surveys.

Defense Procurement Circular No. 27, April 29, 1964. December 1964 Edition of Standard Form 33, Invitation, Bid, and Award (Supply Contract) and Standard Form 33A, Bidding Instructions, Terms, and Conditions (Supply Contract); and Warranty clauses, ASPR 1-324.6(a).

Defense Procurement Circular No. 28, May 24, 1965. ASPR Section XXI—Procurement Management Reporting System.

Each Defense Procurement Circular (DPC) is designed to place new or changed policies or procedures in effect prior to publication of an Armed Services Procurement Regulation (ASPR) revision. The items in each circular are cancelled after six months, unless specifically eliminated earlier by a new DPC or by publication in the ASPR. ASPR subscribers will receive Defense Procurement circulars and ASPR revisions through the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

*Guidelines for Developing and Submitting and Unsolicited Proposal to the Navy Department (NAVMAT P-4201), March 1965.*

*Guidelines for Preparing More Effective Engineering Proposals (NAVMAT P-4856), March 1965.*

NAVMAT Guidelines are available from:  
Chief of Naval Material (MAT 444)  
Department of the Navy  
Washington, D.C. 20360

*Congressional Directory, 89th Congress, January 1965.* Beginning with a brief biography of the Vice President, this official directory presents short biographies of each of the Members of the Senate and of the House, listed by States and districts, respectively. Additional data on each of the lawmakers is also included, such as his committee memberships, terms of service, administrative assistant and secretary, and room and telephone number. The directory also lists officials of the courts, the military establishment and other Federal departments and agencies; Governors of States and Territories; foreign diplomats; and members of the press, radio and television galleries. A description of the Capitol building, its grounds and floor plans is included, as are maps of the congressional districts for each state.

Catalog No.  
Y4.P93/1:1/89-1 Cloth \$3.00  
Thumb-Indexed Edition Cloth \$4.75

*Pocket Congressional Directory, 89th Congress, January 1965.* Photographs of President Lyndon B. Johnson, Vice President Hubert H. Humphrey, officials of the Senate, House, the Capitol, and members of Congress are contained in this volume. It also includes a list of State delegations, and alphabetical lists of the Senators, Representatives and Resident Commissioner, showing home post office and political alignment. 202 p. il.

Catalog No.  
Y4.P93/1:1p/89 Cloth \$1.75

*United States Government Organization Manual, 1965-66.* Official organization handbook of the Federal Government.

Catalog No. GS4.109:965 \$1.75

*NASA Incentive Contracting Guide.* This guide has been published to provide authoritative guidance and sound precepts to all personnel concerned

with the negotiation and administration of incentive arrangements in NASA contracts. 1965.

Catalog No. NAS1.18:1n2/2 \$1.00

*Proposed Mutual Defense and Development Programs, FY 1966, Summary Presentation to the Congress.* Intended to provide members of Congress with a general summary of the mutual defense and development programs proposed for FY 1966, this volume discusses foreign aid in perspective, Alliance for Progress, Near East and South Asia, Far East, Africa, private resources in international development, management improvements, other assistance programs and analysis of the FY 1966 request by funding category. Included in the appendix is the President's Message on Foreign Aid and statistical tables.

1965. 243 p. il.  
Catalog No. S18.28:966 \$1.00

Publications that require remittance are available for purchase at U.S. Government Printing Office, Washington, D.C.

The 1965 edition of *United States Aircraft, Missiles and Spacecraft* is now available. This 168-page pictorial book presents a comprehensive account of the aircraft, missiles and space vehicles currently in operation and in production or development in the U.S. aerospace industry. It is published by the National Aerospace Education Council and prepared in cooperation with the Aerospace Industries Association. It may be obtained from the Council at 1025 Connecticut Ave., NW, Washington, D.C. 20036. \$2.00.

The following Government research & development reports are available to science and industry through the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Va. 22151:

Order AD 610 210N, *A Factor Analytic Approach to Human Engineering Analysis and Prediction of System Maintainability*, Air Force Behavioral Sciences Laboratory, Wright-Patterson AFB, Dec. 1964, 88 pp., \$3.00.

Order AD 613 522N, *An Annotated Bibliography on Proficiency Measurement for Training Quality Control*, George Washington University for the Army, June 1964, 29 pp., \$2.00.

# NOTES FOR EDITORS

Briefed below are some events and projects within the Department of Defense which may be of interest to writers and editors. If further information on any of these topics is desired, please write to Chief, Magazine and Book Branch, Office of the Assistant Secretary of Defense, Public Affairs, Washington, D.C. 20301.

## REFAB HOUSING SOUGHT FOR AIR FORCE OVERSEAS FAMILIES

In order to offset the adverse "gold flow" associated with family housing projects overseas, the Air Force is developing a two-story dwelling with three bedrooms, one and a half baths and more than 1000 square feet of living space. It will be prefabricated in the United States and partially pre-assembled into two compact shipping packages for easy handling and delivery to foreign bases where the house can be quickly assembled.

## NEW HELICOPTER MOUNTED GRENADE LAUNCHER DELIVERED

The Army has accepted the first weapon developed specifically for firing 40mm grenades from helicopters. Designated the M-5, the new weapon subsystem is designed to provide helicopters with a suppressive-fire capability. The 200-pound weapon fires a 40mm high explosive grenade at the rate of more than 200 per minute. It is electrically driven, and can be operated by either the pilot or a gunner. First delivery has been made to Aberdeen Proving Ground, Md. Production items will be delivered to field units later this year.

## DATA PROCESSING SYSTEM SPEEDS NAVY SUPPLY SYSTEM

Since January 1963 the Navy Supply Corps has been rapidly expanding its Uniform Automatic Data Processing System (UADPS) for stock points so that today it is operating seven locations with two more planned for the near future. The Navy's Chief of Supplies and Accounts believes UADPS has brought the Navy "a long way toward assuring optimum supply response and control." The magnitude of the system can best be illustrated by the volume just one of the seven stock control points handles. The Norfolk Naval Supply Office carries 750,000 items and makes approximately 3,400,000 issues a year. The functioning of UADPS includes: inventory control; financial inventory control; material movement control; stores, cost, allotment, appropriation and payroll accounting. The basic mission of UADPS is to speed the de-

livery of supplies to the customer—the ships of the fleet.

## AIR NATIONAL GUARD AND RESERVE CREWS FLYING AIRLIFT TO VIETNAM

Air National Guard and Air Force Reserve crews stationed in various units throughout the country are now flying volunteer airlift missions from the United States to South Vietnam. Since 1961, Air Guardsmen have flown more than 200 missions to Southeast Asia carrying cargo and equipment in C-121 and C-97 aircraft. Air Force Reserve crews in C-124's started flying missions to Saigon in February of this year. They are now augmenting the Military Air Transport Service (MATS) trans-Pacific airlift to the Philippines and Southeast Asia.

## NAVY REVERTS TO 120-YEAR-OLD PRACTICE

The Navy Oceanographic Office has begun contracting with commercial ships to gather extensive oceanographic data—an enlargement of a technique first used by Matthew Fontaine Maury, the Navy's first oceanographer 120 years ago. Participating commercial lines will make bathy-thermograph drops twice daily which will measure temperature versus depth on a glass slide. U.S. Navy ships regularly provide the Oceanographic Office with this information. The program is another part of the Navy's expanded effort to learn the mysteries of the sea.

Commercial shippers have voluntarily supported the Navy for better than a century. The early hydrographic charts published by the Navy were based mainly on the voluntary observations made by merchant mariners. Wind and current charts produced by Maury were largely respon-

sible for the early speed records of Yankee clipper ships.

## NEW TECHNIQUE FOR TRAINING C-5A MAINTENANCE CREWS

The Technical Training Center at Sheppard AFB, Tex., has been named the prime technical training center for the C-5A cargo aircraft. It will conduct training of maintenance personnel in certain specialties peculiar to the equipment of the aircraft and supervise the training at other ATC centers. The new technique in procurement necessitates long-range planning and training that must parallel the development of a new aircraft or new operational system. Purpose of the training program is to assure that qualified maintenance personnel are available when the first operational aircraft is delivered.

## THE CHOICE IS HERS

This summer—from July 11 through August 6—120 selected young women between their junior and senior years of college will attend the Women's Army Corps College Junior Course at Fort McClellan, Ala. The course is designed to enable a college woman to find out if life as a WAC officer is for her. During four weeks of active duty, these college juniors from all fifty states will be cadet corporals in the Enlisted Reserve and receive \$122.30. All transportation as well as uniforms, meals and medical expenses will be paid by the Army. The summer course in no way obligates the woman for further service. Upon graduation from college, these women may decide to continue in the Women's Army Corps as Second Lieutenants or may elect to be discharged from the Reserve.



An Example of Prefabricated House Developed for U. S. Air Force Family Housing Projects (See first item above)

## Patents, Proprietary Rights & Military Equipment

(Continued from Page 2)

termining the division of rights in inventions made under a contract, to the contribution made by firms with a record of sales of military items to foreign governments or international organizations, or of licensing in connection therewith. Although there appears to have been some increase in the use of the "title" clause, it is expected that the "license" clause will continue to be utilized in a preponderance of cases.

In the "license" situation, the research and development contract leaves the ownership of inventions resulting from performance of work under the contract to the contractor, with the Government taking a license for all "Governmental purposes," including the Military Assistance Program. In addition, however, the Government is accorded "the right to grant licenses to any foreign government or international organization specifically for use in programs established by International Agreements for research, development, or production of weapons or equipment for mutual defense." The quoted language, which is commonly known as the Government's "sublicensing authority," has been criticized by various segments of U. S. defense industry. The major objection has been that the U. S. firm can never be sure that the Government will not, in connection with a specific program, decide to convey a royalty-free license under this authority. At least conceivably, the Government could thus cut the ground from under a U. S. contractor who had incurred expenses in filing for and maintaining patent coverage in foreign countries and in promoting license arrangements. Faced with this uncertainty, the U. S. contractor cannot afford, it is argued, to invest the time and money needed to patent inventions and develop profitable licensing arrangements.

On the other hand, it is understandable that the Government should desire to have at its disposal the tools it needs to establish cooperative programs with other friendly governments in the field of mutual defense, without undue hindrance from U. S. firms which might possibly prefer not to accord licenses on any terms to potential overseas competitors.

A Working Group on Patents, consisting of both Government and industry representatives, made a study recently of these and other considerations and concluded that a fair balance could be achieved by amending the "sublicensing authority" in such a way that (1) the U. S. contractor-owner of the inventions would receive fair compensation from the foreign licensee whenever the Government invoked the sublicensing authority and (2) the sublicensing authority could in any event only be utilized with respect to foreign governments which did not under their own law have the power to infringe patents for defense or governmental purposes. Final Defense Department action on this recommendation has not yet been taken.

With respect to the Defense Department's policy regarding the procurement of rights in technical data under research and development contracts, considerations analogous to those outlined above have animated the discussion. Again, the essence of the position taken by many U. S. industry representatives is that the Government should take no greater rights in technical data delivered under a contract than is strictly necessary for the fulfillment of Government purposes. The greater the "rights" in data which are left in the contractor, the greater will be the latter's incentive, and negotiating strength, in marketing this technology abroad. It is argued that there is no reason why the Government, as "owner" of much technical data delivered under contracts, should transfer such data free of charge to foreign governments when there is no reciprocal benefit to either the Government or U. S. industry—in part because these same foreign governments tend to leave ownership of similar data in the hands of their private contractors.

On the other hand, the problem is complicated by at least three factors: (1) the ASPR "rights in data" section was recently revised, after extensive consideration

by both Government and industry, to draw a basic distinction according to whether the data pertains to an item which was developed at private expense, or was the result of Government-financed research and development; in the latter case, the Government's "unlimited rights" entitled to it to use or dispose of the data for any purpose whatever; (2) it is difficult, if not impossible, to construct a tenable legal theory under which data which might be used by the Government for any legitimate Governmental purpose could still be legally protectible in other circumstances by the contractor; and (3) given the amount of valuable know-how, technical assistance and proprietary data which U. S. contractors are even now in a position to offer to potential licensees, it is not clear how important, or even desirable, it might be to increase the contractor's control over the type of data that is now being delivered to the Government without restriction.

The last word in this difficult field is yet to be spoken. But it is clear that the imperatives of the military export program will continue to make themselves felt in the formulation of Defense patent and data procurement policy.

## Major Crossroads in Space Program

(Continued from Page 13)

We are only one of the many organizations sponsoring this kind of research. I am frequently called on to answer why the Air Force should be involved in basic research at all. More specifically, when discussing the space program, I am asked why the Air Force should participate in space research when it is specifically included in NASA's charter and they are supporting it so heavily.

First of all, at its most fundamental level, it is frequently difficult to determine what *is* a space science. Plasma physics may ultimately lead to better aircraft communications, or it may lead to improved space propulsion.

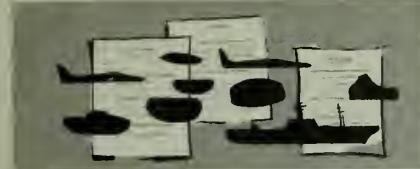
Probably more pertinently, however, I look upon my organization as the Air Force's window on science. OAR is a relatively small organization, and we do only a small percentage of the total research of potential interest to the Air Force. But by doing that small fraction, we act as the Air Force's eyes and ears, and interpreters and advisors on the whole world of science, wherever it may be going on. And to perform this function, I am convinced that we must be *active* participants, not merely passive observers reading technical papers.

It is in this sense that I view our relationship with NASA.

Fundamental knowledge is politically neutral. Given a basic knowledge of nuclear physics, you can construct a nuclear power plant or an atom bomb, or both, depending upon the political decisions of the Government in power. We, in the military, need new knowledge in order to perform our current military tasks more effectively, to be able to perform tasks we can project for the future and to prevent technological surprise. But the knowledge we seek is not military knowledge. It is universal knowledge, with national and even global implications. It is for this reason that the Military Services can and do cooperate so closely with NASA and other civilian research agencies of the Federal Government in our search for basic knowledge about the space environment. Although we want this knowledge for whatever military purposes we can find for it, it is the same knowledge that is sought for different purposes by scientists in the universities, industry and other research organizations.

I haven't attempted to answer the question of which direction our space program should take in the future. Even if I could, I wouldn't attempt it, for whether you are a scientist, an engineer, a manager, a businessman, a public servant, or a teacher, you, collectively, are the ones who are going to have to help make these decisions.

I have tried to indicate that, in order to make these decisions intelligently, rationally and objectively, we are going to require more information—information at the basic, building-block level of human knowledge. The decisions to date have not been easy. Those in the future are going to be much more difficult and complex.



## DEFENSE PROCUREMENT

Contracts of \$1,000,000 and over awarded during month of May 1965:

### DEFENSE SUPPLY AGENCY

- 3—McCord Corp., Detroit, Mich. \$1,147,250. 325,000 steel helmets. Detroit. Defense Clothing and Textile Supply Center, Philadelphia, Pa.
- 4—Standard Oil Co. of California, Western Operations, Inc., San Francisco, Calif. \$3,924,500. 1,650,000 barrels of special fuel oil for the Navy. Defense Fuel Supply Center, Washington, D.C.
- Socony Mobil Oil Co., Inc., New York City. \$1,650,090. 735,000 barrels of special fuel oil. Defense Fuel Supply Center, Washington, D.C.
- 7—Socony Mobile Oil Co., Inc., New York City. \$4,197,293. Gasoline and fuel oil. Defense Fuel Supply Center, Washington, D.C.
- American Oil Co., Chicago, Ill. \$2,048,587. Gasoline and fuel oil. Defense Fuel Supply Center, Washington, D.C.
- 19—Standard Oil Co. of California, Western Operations, Inc., San Francisco, Calif. \$5,011,300. 275,000 barrels diesel marine fuel oil and 1,650,000 barrels Navy special fuel oil. Defense Fuel Supply Center, Washington, D.C.
- American Oil Co., Chicago, Ill. \$2,884,350. 895,000 barrels diesel marine fuel oil. Defense Fuel Supply Center, Washington, D.C.
- Richfield Oil Corp., Los Angeles, Calif. \$1,686,282. 282,000 barrels Arctic diesel fuel oil, 30,000 barrels diesel marine fuel oil and 200,000 barrels Navy special fuel oil. Defense Fuel Supply Center, Washington, D.C.
- Shell Oil Co., New York City. \$1,361,400. 200,000 barrels Type II automotive gasoline and 100,000 barrels Type I automotive gasoline. Defense Fuel Supply Center, Washington, D.C.
- 21—Richfield Oil Corp., Los Angeles, Calif. \$9,722,790. 67,200,000 gallons aviation gasoline. Defense Fuel Supply Center, Washington, D.C.
- Cities Service Oil Co., New York, N.Y. \$6,598,127. 50,400,000 gallons aviation gasoline. Defense Fuel Supply Center, Washington, D.C.
- Socony Mobil Oil Co., Inc., New York, N.Y. \$6,199,417. 47,829,500 gallons aviation gasoline. Defense Fuel Supply Center, Washington, D.C.
- Standard Oil of California, Western Operations, Inc., San Francisco, Calif. \$5,267,682. 36,994,800 gallons aviation gasoline. Defense Fuel Supply Center, Washington, D.C.
- Continental Oil Co., Houston, Tex. \$4,785,010. 36,743,000 gallons aviation gasoline. Defense Fuel Supply Center, Washington, D.C.
- Tidewater Oil Co., New York, N.Y. \$4,262,280. 33,000,000 gallons aviation gasoline. Defense Fuel Supply Center, Washington, D.C.
- Phillips Petroleum Co., Bartlesville, Okla. \$3,794,185. 29,471,000 gallons aviation gasoline. Defense Fuel Supply Center, Washington, D.C.
- Tidewater Oil Co. of Los Angeles, Calif. \$3,743,625. 27,300,000 gallons aviation gasoline. Defense Fuel Supply Center, Washington, D.C.

### Contract Index

Contract information is listed in the following sequence: Date—Company—Dollar Value—Material—Location of Work Performed—Contracting Agency

- Standard Oil Co. (Kentucky), Louisville, Ky. \$2,841,-350. 22,341,000 gallons aviation gasoline. Defense Fuel Supply Center, Washington, D.C.
- Union Oil Co. of California, Los Angeles, Calif. \$4,-354,906. 30,956,000 gallons aviation gasoline. Defense Fuel Supply Center, Washington D.C.
- Texas City Refining, Inc., Texas City, Tex. \$2,214,702. 17,010,000 gallons aviation gasoline. Defense Fuel Supply Center, Washington, D.C.
- American Oil Co., Chicago, Ill. \$2,037,729. 14,179,000 gallons aviation gasoline. Defense Fuel Supply Center, Washington, D.C.
- Humble Oil and Refining Co., Houston, Tex. \$2,021,-007. 13,353,000 gallons aviation gasoline. Defense Fuel Supply Center, Washington, D.C.
- Shell Oil Co., New York, N.Y. \$1,846,180. 13,038,000 gallons aviation gasoline. Defense Fuel Supply Center, Washington, D.C.
- Shamrock Oil and Gas Corp., Amarillo, Tex. \$1,347,-380. 10,765,000 gallons aviation gasoline. Defense Fuel Supply Center, Washington, D.C.
- Ashland Oil and Refining Co., Ashland, Ky. \$1,133,-048. 7,890,000 gallons aviation gasoline. Defense Fuel Supply Center, Washington, D.C.
- 24—General Cable Corp., New York, N.Y. \$1,081,916. 20,-473 reels of telephone cable. Providence, R.I. Defense Industrial Supply Center, Philadelphia, Pa.
- Augusta Bag and Burlap Co., Augusta, Ga., \$1,340,-574. 7,620,800 sand bags. Augusta. Defense General Supply Center, Richmond, Va.
- 26—Humble Oil and Refining Co., Houston, Tex. \$3,031,-800. 900,000 barrels of diesel fuel oil. Defense Fuel Supply Center, Washington, D.C.
- Socony Mobil Oil Co., Inc., New York City. \$1,790,250. 500,000 barrels diesel fuel oil. Defense Fuel Supply Center, Washington, D.C.
- 27—Socony Mobil Oil Co., Inc., New York City. \$2,235,000. 1,035,000 barrels of fuel oil. Defense Fuel Supply Center, Washington, D.C.
- 28—Standard Oil Co. of California (Western Operations, Inc.), San Francisco, Calif. \$1,245,440. 8,960,000 gallons of RP-1 rocket fuel. Defense Fuel Supply Center, Washington, D.C.

### ARMY

- 3—Lockheed Aircraft Corp., Lockheed Electronics Co. div., Clark, N.J. \$1,099,000. Non-personal technical port services on range instrumentation equipment. White Sands Missile Range, N. M. White Sands Missile Range (AMC), N. M.
- Peter Kiewit Sons Corp., Vancouver, Wash. \$9,465,-721. Union Pacific Railroad relocation, Part II, Hinkle-Spokane main line. Lower Monumental Lock and Dam Project, Pasco, Wash. Engineer District, Seattle, Wash.
- Eltra Corp., Prestolite Co., Div., Toledo, Ohio. \$1,047,-487. Engine generator regulators for tactical and combat vehicles. Decatur, Ala. Army Tank Automotive Center (AMC), Warren, Mich.
- Browning Construction Co., San Antonio, Tex., \$1,319,-850. Renovation of Camp Gary, Phase II. Camp Gary, San Marcos, Tex. Engineer District, Fort Worth, Tex.
- 4—North American Aviation, Inc., Space and Information Div., Downey, Calif. \$2,115,000. Research to develop a mobile medical laboratory unit to support a field army in laboratory sciences discipline. Downey and El Segundo, Calif. Office of the Surgeon General, U.S. Army R&D Command (AMC), Washington, D.C.

6—Philco Corp., Philadelphia, Pa. \$2,000,000. Classified electronics equipment. Philadelphia. Procurement Div. of Army Electronics Command (AMC), Philadelphia, Pa.

7—Hamilton Watch Co., Lancaster, Pa. \$1,350,000. Ordnance items. Lancaster. Ammunition Procurement and Supply Agency (AMC), Joliet, Ill.

—General Electric Co., Burlington, Vt. \$5,088,124. Vulcan pods—a detached system for mounting 20mm automatic guns to bomb rack of aircraft. Burlington, Boston, Mass., Procurement District (AMC).

—Radio Corp. of America, Defense Electronics Products Div., Burlington, Mass. \$1,250,800. Phase II of multi-system test equipment for the SHILLELAGH, LANCE and TOW systems. Burlington. U.S. Army Missile Command (AMC), Huntsville, Ala.

10—Specialty Electronics Development Corp. \$1,046,555. 288 manual telephone switchboards and 333 telephone signal assemblies. Glendale. Procurement Div. of Army Electronics Command, Philadelphia, Pa.

—Arvin Industries, Inc., Electronic Systems Div., Columbus, Ind. \$1,291,648. Coder equipment components. Columbus. Procurement Div. of Army Electronics Command, Philadelphia, Pa.

—PrePakt Concrete Co., Renton, Wash. \$1,340,097. Repair of the navigation lock on the Ice Harbor Lock and Dam, Snake River Project. Pasco, Wash. District Corps of Engineers.

11—Matanuska Maid, Inc., Anchorage, Alaska. \$1,353,006. Milk. USARAL Support Command and Fort Richardson, Alaska.

—Fowler's Dairy Farm, Shaw Creek, Alaska. \$21,080. Milk. USARAL Support Command and Fort Richardson, Alaska.

—Arden North Star Dairy, Inc., Anchorage, Alaska. \$669,990. Milk. USARAL Support Command and Fort Richardson, Alaska.

—Sperry Rand Corp., Sperry Phoenix Co., div., Phoenix, Ariz. \$1,170,076. Gyro magnetic compass sets with ancillary parts for Army aircraft. Phoenix. U.S. Army Electronics Command (AMC), Fort Monmouth, N.J.

12—Smith and Sapp Construction Co., Orlando, Fla. \$1,616,970. Construction alterations to existing space-craft facilities at Cape Kennedy, Fla. Canaveral District Corps of Engineers, Merritt Island, Fla.

—Martin-Marietta Corp., Martin Co., div., Orlando, Fla. \$11,063,752. Research and development work on Project RADA (Random Access Discrete Address). Orlando, Fla. Electronics Command (AMC), Fort Monmouth, N.J.

—Umpqua River Navigation Co., Reedsport, Ore. \$4,899,000. Work on Grays Harbor, Wash., Project. Aberdeen, Wash. U.S. Army Engineer District, Seattle, Wash.

13—Space-General Corp., El Monte, Calif. \$1,000,000. Advanced development of a detection device for biological research. El Monte. U.S. Army Biological Laboratories (AMC), Fort Detrick, Md.

14—R. A. Heintz Construction Co., Portland, Ore. \$2,776,250. Work on John Day Lock and Dam Project. The Dalles, Ore. District Corps of Engineers, Walla Walla, Wash.

—Bulova Watch Co., Inc., Flushing, N.Y. \$1,508,800. Rocket ammunition fuzes. Flushing. New York City Procurement District (AMC).

—HRB Singer, Inc., State College, Pa. \$9,387,226. Infrared surveillance systems and associated support equipment for use with the OV/1C MOHAWK aircraft. State College. Procurement Div. of Army Electronics Command (AMC), Philadelphia, Pa.

—International Harvester Co., Washington, D.C. \$1,098,210. 160 commercial type dump trucks. Springfield, Ohio. Army Tank Automotive Center (AMC), Warren, Mich.

—Teletype Corp., Skokie, Ill. \$1,000,000. Classified electronic equipment. Skokie. U.S. Army Electronics Command (AMC), Fort Monmouth, N.J.

17—Canadian Commercial Corp., Ottawa, Ontario. \$1,099,740. 793 gasoline driven generator sets. E. P. Elec- tric Products Co., Ltd., Montreal, Quebec. Engineer Procurement Office, Chicago, Ill.

—Fisher Construction Co., Houston, Tex. \$1,435,119. Construction of the crew systems facility at the Manned Spacecraft Center, Houston, Tex. District Corps of Engineers, Fort Worth, Tex.

—Firestone Tire and Rubber Co., Akron, Ohio. \$1,018,774. Shoe assemblies for the M113 personnel carrier. Noblesville, Ind. Army Tank Automotive Center (AMC), Warren, Mich.

18—Kaiser Jeep Corp., Toledo, Ohio. \$2,323,353. 111 five-ton wrecker trucks. South Bend, Ind. Army Mobility Command (AMC), Warren, Mich.

19—Philco Corp., Aeronutronic Div., Newport Beach, Calif. \$1,296,000. Engineering and design of an adaptation of the SHILLELAGH Missile System to replace the present 105mm gun in the M60 Tank. Army Missile Command (AMC), Huntsville, Ala.

—SCM Corp., Kleinschmidt Div., Deerfield, Ill. \$1,032,008. 248 teletypewriter sets with ancillary items. Deerfield. Electronics Command (AMC), Fort Monmouth, N.J.

21—Peter Reiss Construction Co., Inc., Forest Hills, N.Y. \$1,428,000. Site preparation for Washington Hall barracks complex at U.S. Military Academy, West Point, N.Y. Engineer District, New York, N.Y.

—Chrysler Motor Corp., Detroit, Mich. \$6,412,000. 4,000  $\frac{3}{4}$ -ton cargo pickup trucks. Warren, Mich. Army Tank Automotive Center (AMC), Warren, Mich.

—Honeywell, Inc., Hopkins, Minn. \$1,293,545. 40mm cartridge fuzes and special tooling. Twin Cities Army Ammunition Plant, New Brighton, Minn. Ammunition Procurement and Supply Agency (AMC), Joliet, Ill.

—Ingraham Co., Bristol, Conn. \$7,697,008. Metal parts for fuzes. Bristol, Terryville and Waterbury, Conn. Ammunition Procurement and Supply Agency (AMC), Joliet, Ill.

24—Weatherhead Co., Cleveland, Ohio. \$2,512,756. 105mm projectiles. Cleveland. Ammunition Procurement and Supply Agency (AMC), Joliet, Ill.

—Fryd Construction Corp., Miami Beach, Fla. \$1,750,557. Construction of a composite medical facility at Homestead AFB, Fla. District Corps of Engineers, Jacksonville, Fla.

—Greenhut Construction Co., Inc., Pensacola, Fla. \$3,363,903. Construction of a three-story composite medical facility at Eglin AFB, Fla. District Corps of Engineers, Mobile, Ala.

—G. H. Lindekugel and Sons, Inc., Mitchell, S.D. \$1,789,767. Work on Saylerville Dam and Reservoir, Des Moines River, Iowa, Project. Des Moines, Iowa. U.S. Army Engineer District, Rock Island, Ill.

25—E. E. Black, Ltd., Honolulu, Hawaii. \$2,101,000. Construction of 100 units of noncommissioned officers family housing, including supporting utilities, site preparation and carparks, at Hickam AFB, Hawaii. District Corps of Engineers, Honolulu, Hawaii.

—Bowen-McLaughlin-York, Inc., York, Pa. \$1,049,760. 486 half ton platform trucks. York. Army Tank Automotive Center (AMC), Warren, Mich.

26—General Motors Corp., Allison div., Indianapolis, Ind. \$1,480,000. Breech actuator assemblies for the gun/launcher on the General Sheridan, X551 vehicle. Indianapolis. Watervliet Arsenal (AMC), Watervliet, N.Y.

—Mars Constructors, Inc., Honolulu, Hawaii. \$1,761,000. Construction of four equipment shops, Schofield Barracks, Hawaii. District Corps of Engineers, Honolulu, Hawaii.

—H. O. Boehme, Inc., Westbury, L.I., N.Y. \$1,799,215. Light weight transportable page printer teletypewriter sets with ancillary items. Westbury. Procurement Div., of Electronics Command (AMC), Philadelphia, Pa.

—Model Engineering and Mfg. Corp., Currer Products Div., Boyne City, Mich. \$4,323,350. Radio sets and radio receiver-transmitters. Huntington, Ind. Procurement Div. of Electronics Command (AMC), Philadelphia, Pa.

—Otis Elevator Co., Defense and Industrial Div., Brooklyn, N.Y. \$1,012,336. Radio sets. Stamford, Conn. Procurement Div. of Army Electronics Command (AMC), Philadelphia, Pa.

—SCM Corp., Kleinschmidt Div., Deerfield, Ill. \$1,407,592. Teletypewriter sets and ancillary items. Deerfield. Procurement Div. of Electronics Command (AMC), Philadelphia, Pa.

—Aircraft Radio Corp., Boonton, N.J. \$1,924,439. Radio receiver sets and components. Boonton. Procurement Div. of Electronics Command (AMC), Philadelphia, Pa.

—Hughes Tool Co., Aircraft Div., Culver City, Calif. \$2,122,779. Light Observation Helicopters with supporting publications, engineering data, selected parts and special tools. Culver City. Aviation Command (AMC), St. Louis, Mo.

—Southwest Truck Body Co., St. Louis, Mo. \$2,026,402. Six-ton, semi-trailer, shop vans for aircraft shop sets. West Plains, Mo. Army Tank Automotive Center (AMC), Warren, Mich.

—Continental Motors Corp., Muskegon, Mich. \$13,490,382. Multi-fuel engines. Muskegon. U.S. Army Mobility Command (AMC), Warren, Mich.

—Kaiser Jeep Corp., Toledo, Ohio. \$52,378,085. Various types of five-ton trucks with government furnished multi-fuel engines. South Bend, Ind. U.S. Army Mobility Command (AMC), Warren, Mich.

—Albion Malleable Iron Co., Albion, Mich. \$2,553,826. 2.75 inch rocket components. Hillsdale, Mich. Ammunition Procurement and Supply Agency (AMC), Joliet, Ill.

—Sovereign Construction Co., Ltd., Fort Lee, N.J. \$2,384,200. Construction of an environmental medicine laboratory at the U.S. Army Natick Laboratories, Natick, Mass. New England Engineer District, Waltham, Mass.

27—Shellmaker, Inc., San Francisco, Calif. \$1,118,400. Dredging work on the Sacramento River Ship Canal Project. Sacramento, Salano, and Contra Costa Counties, Calif. Sacramento District Corps of Engineers, Sacramento, Calif.

—Electrospace Corp., Glen Cove, N.Y. \$2,153,284. 739 radio sets (AN/GRC-10) and six dynamotor power supply units (DY-94/GRC-10). Naguabo, Puerto Rico. Procurement Div., Electronics Command (AMC), Philadelphia, Pa.

—Markwell and Hartz, Inc., Memphis, Tenn. \$1,746,104. Work at the Cave Run Reservoir on the Licking River, Kentucky Project. Cave Run Reservoir, Farmers, Ky. Louisville District Corps of Engineers.

28—Electrospace Corp., Glen Cove, N.Y. \$2,152,580. 739 radio sets and six Dynamotor Power Suppliers. Naguabo, Puerto Rico. Procurement Div. of Electronics Command (AMC), Philadelphia, Pa.

—FMC Corp., Ordnance Div., San Jose, Calif. \$4,200,124. Armored Personnel Carriers (M113A1) and mortar Carriers (M125A1). South Charleston, W. Va. Army Tank Automotive Center (AMC), Warren, Mich.

—Bowen-McLaughlin-York, Inc., York, Pa. \$1,915,650. Self-propelled 175 mm guns; self-propelled eight-inch howitzers; and recovery vehicles. York. Army Tank Automotive Center (AMC), Warren, Mich.

—General Dynamics Corp., Pomona, Calif. \$3,685,661. Work on the MAULER weapon system. Pomona. Los Angeles Procurement District (AMC), Pasadena, Calif.

—F. Miller and Sons, Inc., Lake Charles, La. \$3,080,441. Work on the Calcasieu River and Pass, Louisiana, Project. Calcasieu Parish, La. Engineer District, New Orleans, La.

—Van Buskirk Construction Co. and Graves Construction Co., Inc., Sioux City, Iowa. \$6,833,484. Work on the Rathbun Dam and Reservoir, on the Chariton River, Project. Centerville, Iowa. District Corps of Engineers, Kansas City, Mo.

—Greer Brothers and Young, Inc., London, Ky. \$2,215,099. Work on the Grayson Reservoir, Kentucky Project. Grayson. Engineer District, Huntington, W. Va.

—Day and Zimmerman, Inc., Philadelphia, Pa. \$7,920,984. Loading, assembling and packing of ordnance items. Lone Star Army Ammunition Plant, Texarkana, Tex. Ammunition Procurement and Supply Agency (AMC), Joliet, Ill.

—Hercules Powder Co., Wilmington, Del. \$10,917,962. Loading, assembling and packing of miscellaneous propellants and explosives, and NIKE boosters. Radford Army Ammunition Plant, Radford, Va. Ammunition Procurement and Supply Agency (AMC), Joliet, Ill.

—Harvey Aluminum Sales, Inc., Torrance, Calif. \$6,484,220. Classified items. Milan Army Ammunition Plant, Milan, Tenn. Ammunition Procurement and Supply Agency, Joliet, Ill.

—Ford Motor Co., Special Military Vehicle Operations, Dearborn, Mich. \$1,065,000. Production and inspection engineering services for the M151, 1/4-ton, utility trucks. Dearborn. Mobility Command (AMC), Warren, Mich.

—Caterpillar Tractor Co., Peoria, Ill. \$2,065,569. Tractors with bulldozer, scarifier and scraper controls. Peoria, Ill. Mobility Equipment Center, (AMC), St. Louis, Mo.

## NAVY

3—United Aircraft Corp., Pratt and Whitney Aircraft Div., East Hartford, Conn. \$66,040,416. TF-33 aircraft engines for the Air Force. East Hartford. Bureau of Naval Weapons.

—Texas Instruments, Inc., Dallas, Tex. \$2,859,415. Attitude heading reference systems for Navy aircraft. Dallas. Bureau of Naval Weapons.

—Youngstown Welding Engineering Co., Youngstown, Ohio. \$1,019,681. Torpedo tube sets for two nuclear powered attack submarines. Youngstown. U.S. Naval Supply Center, Oakland, Calif.

5—Norris Thermador Corp., Los Angeles, Calif. \$1,475,625. Bomb casings. Vernon, Calif. U.S. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—Lockheed Missiles and Space Co., Sunnyvale, Calif. \$1,493,076. POLARIS surface support equipment. Sunnyvale. Special Projects Office.

6—Control Data Corp., Minneapolis, Minn. \$1,796,000. Manufacture of POLARIS target card computer system for use on SSBN 598 (USS GEORGE WASHINGTON) and 608 (USS ETHAN ALLEN) class submarines. Minneapolis. Special Projects Office.

—Sperry Rand Corp., Sperry Gyroscope Co., Great Neck, L.I., N.Y. \$1,793,000. Research and development on TALOS guided missile weapons control system. Great Neck. Bureau of Naval Weapons.

—Texas Instruments Inc., Dallas, Tex. \$1,459,063. Radar set components. Dallas. U.S. Navy Aviation Supply Office, Philadelphia, Pa.

7—Raytheon Co., Lexington, Mass. \$1,850,002. Hydraulic power units for SPARROW III missiles. Lowell, Mass. Bureau of Naval Weapons.

10—Westinghouse Electric Corp., Baltimore, Md. \$22,358,416. Pulse doppler missile control systems for F-4 aircraft. Baltimore. Bureau of Naval Weapons.

—Lockheed Missiles and Space Co., Sunnyvale, Calif. \$1,147,980. Technical services and engineering support for the POLARIS program. Sunnyvale. Special Projects Office.

—Dow Metal Products Co., Div. of Dow Chemical Co., Madison, Ill. \$3,958,458. 51,576 airfield matting extrusions. Madison. Naval Air Engineering Center, Philadelphia, Pa.

11—Otis Elevator Co., Brooklyn, N.Y. \$1,168,505. Sonobuoys. Brooklyn. Bureau of Naval Weapons.

—Lockheed Missiles and Space Co., Sunnyvale, Calif. \$2,020,700. Research and development for POLARIS program. Sunnyvale. Special Projects Office.

—Colby Crane & Mfg. Co., Div. of Lockheed Shipbuilding & Construction Co., Seattle, Wash. \$1,219,492. Four 30-ton boat and repair cranes. Seattle. U.S. Puget Sound Naval Shipyard, Bremerton, Wash.

—General Dynamics Corp., Electric Boat Div., Groton, Conn. \$39,841,755. Construction of one submarine tender (AS). Quincy, Mass. Bureau of Ships.

12—Hughes Aircraft Co., Fullerton, Calif. \$4,552,278. Components to be used on Naval Tactical Data System (NTDS) equipment aboard naval ships. Fullerton. Bureau of Ships.

13—Johns Hopkins University, Silver Spring, Md. \$4,857,997. Continued research and development on missile programs. Silver Spring. Bureau of Naval Weapons.

—Textron, Inc., Oregon Technical Products Div., Grants Pass, Ore. \$1,464,320. Elementary telemetric data transmitting sets to be used in conjunction with missile programs. Grants Pass. U.S. Naval Avionics Facility, Indianapolis, Ind.

14—Aerojet General Corp., Sacramento, Calif. \$2,667,225. Rocket motors and igniters for TARTAR missiles. Sacramento. Bureau of Naval Weapons.

—Nelse Mortensen and Co., Inc., Seattle, Wash. \$1,516,570. Construction of 100 family housing units at the Naval Shipyard, Bremerton, Wash. Bureau of Yards and Docks, Northwest Div.

—United Aircraft Corp., Sikorsky Aircraft Div., Stratford, Conn. \$11,284,800. Production of CH-3C helicopters. Stratford. Bureau of Naval Weapons.

—Lockheed Shipbuilding and Construction Co., Seattle, Wash. \$48,395,000. Construction of two Amphibious Transports, Dock (LPD). Seattle. Bureau of Ships.

17—Teletype Corp., Skokie, Ill. \$1,083,611. Teletype page printers, including repair parts and technical manuals, for use on naval ships. Skokie. Bureau of Ships.

—Kollmorgen Corp., Northampton, Mass. \$3,067,564. Conversion of seven periscopes and furnishing nine others with associated equipment for installation on nuclear powered attack submarines. Northampton. Bureau of Ships.

18—Planing Research Corp., Los Angeles, Calif. \$1,158,240. Additional study for development of data processing system for operational intelligence. Los Angeles. Office of Naval Research.

—Planing Research Corp., Los Angeles, Calif. \$1,314,264. Additional study for development of data processing system for combatant logistics functions. Los Angeles. Office of Naval Research.

—Curtiss-Wright Corp., Wood-Ridge, N.J. \$1,152,307. Design, fabrication and test of a lift fan engine for VTOL (Vertical Takeoff Landing) application. Wood-Ridge. Bureau of Naval Weapons.

—Columbia University, New York City. \$1,075,000. Additional research and development in nuclear physics. Office of Naval Research.

19—Western Gear Corp., Lynwood, Calif. \$1,020,517. Modification kits, including spare parts and technical manuals, for the variable depth sonar hoist mechanism systems on naval ships. Lynwood. Bureau of Ships.

20—Westinghouse Electric Corp., Sunnyvale, Calif. \$2,348,783. Manufacture of POLARIS MK 13 Model O gas generators. Sunnyvale. Special Projects Office.

—Vortec Products Co., Torrance, Calif. \$1,436,500. M-21 arresting gear systems, used with Marine Corps portable Short Airfield for Tactical Support (SATS). Torrance. Marine Corps.

21—Magnavox Co., Fort Wayne, Ind. \$1,187,122. Sonobuoys. Fort Wayne. Bureau of Naval Weapons.

24—Lockheed Missiles and Space Co., Sunnyvale, Calif. \$11,922,200. Manufacture of components for POLARIS A-3 missile. Sunnyvale. Special Projects Office.

25—Curtiss-Wright Corp., Electronics Div., East Paterson, N.J. \$1,799,489. Radar sets with spare parts, technical manuals and drawings for use by U.S. Army. East Paterson. Bureau of Ships.

26—Raytheon Co., Equipment Div., North Dighton, Mass. \$2,165,679. Radar sets for use with gunfire control systems. North Dighton. U.S. Navy Purchasing Office, Washington, D.C.

27—Northern Ordnance Div., FMC Corp., Fridley, Minn. \$39,516,000. 5-inch gun mounts. Fridley. U.S. Naval Ordnance Plant, Louisville, Ky.

—Sperry Gyroscope Co., Syosset, L.I., N.Y. \$1,225,000. Repair of navigation systems equipment furnished by the company to the Navy. Syosset. Navy Bureau of Ships.

—Sperry Rand Corp., Univac Div., St. Paul, Minn. \$1,200,000. Data processing sets. St. Paul. Navy Bureau of Ships.

28—F. D. Rich Co., Inc., Stamford, Conn. \$6,422,000. Construction of 400 family housing units at the Naval Station, Key West, Fla. Bureau of Yards and Docks, Southeast Div.

## AIR FORCE

3—Sperry Rand Corp., Carle Place, N.Y. \$1,099,307. Procurement of LORAN navigation sets for C-130 aircraft. Great Neck. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

4—Lear Siegler, Inc., Grand Rapids, Mich. \$2,785,828. Aircraft navigation and bombing computer sets. Grand Rapids. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

5—Lockheed Missiles and Space Co., Sunnyvale, Calif. \$5,538,154. Production of AGENA boosters. Sunnyvale. Space Systems Div. (AFSC), Los Angeles, Calif.

6—General Precision, Inc., San Marcos, Calif. \$3,200,000. Navigational systems and associated equipment for C-141 STARLIFTER aircraft. San Marcos. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—Raytheon Co., Waltham, Mass. \$1,443,398. Design, installation and operation of high-speed digital computers for the Air Force. Waltham and Rome, N.Y. Rome Air Development Center (AFSC), Griffiss AFB, N.Y.

7—General Precision, Inc., San Marcos, Calif. \$4,352,857. Components of navigational computers sets, spare parts, and aerospace ground equipment. San Marcos. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—Cutler-Hammer, Inc., Airborne Instruments Laboratory Div., Deer Park, L.I., N.Y. \$13,277,370. Spare parts for airborne electronic reconnaissance systems. Deer Park. Warner-Robins Air Materiel Area (AFLC), Robins AFB, Ga.

—AiResearch Mfg. Co., Div. of Garrett Corp., Phoenix, Ariz. \$1,291,363. Gas turbine generators. Phoenix and El Segundo, Calif. Sacramento Air Materiel Area (AFLC), McClellan AFB, Calif.

10—General Electric Co., Defense Electronics Div., Syracuse, N.Y. \$1,120,795. Test operations for Pacific Missile Range. Vandenberg AFB, Calif. Space Systems Div. (AFSC), Los Angeles, Calif.

11—Perkin-Elmer Corp., Norwalk, Conn. \$3,000,000. Procurement of camera systems for aircraft. Norwalk.

Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—AVCO Corp., Research and Advanced Development Div., Wilmington, Mass. \$1,700,000. Design, development, fabrication, test, and evaluation of MINUTEMAN MARK IIA reentry vehicles. Wilmington. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

12—Sperry Gyroscope Co., Div. of Sperry Rand Corp. \$3,764,600. Radar altimeter systems for C-130, B-52, and CH-3 aircraft. Great Neck. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—Boeing Co., Seattle, Wash. \$6,500,000. Aerospace ground equipment, spares, technical publications and data in support of MINUTEMAN II program. Seattle. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

13—Martin Marietta Corp., Denver, Colorado. \$1,910,000. Supplies and services to support the TITAN II program. Denver. Air Materiel Area (AFLC), Norton AFB, Calif.

—Litton Industries, Inc., Electron Tube Div., San Carlos, Calif. \$1,104,820. Research and development of miniature communication-electronic equipment. San Carlos. Systems Engineering Group (AFSC), Wright-Patterson AFB, Ohio.

—Raytheon Co., Microwave and Power Tube Div., Waltham, Mass. \$1,189,859. Research and development of miniature communication-electronic equipment. Waltham. Systems Engineering Group (AFSC), Wright-Patterson AFB, Ohio.

14—National Co., Inc., Melrose, Mass. \$2,948,455. Procurement of communications equipment. Melrose. Electronic Systems Div. (AFSC), L. G. Hanscom Field, Bedford, Mass.

—Lockheed Aircraft Corp., Marietta, Ga. \$62,196,322. Work on the C-141 jet transport aircraft program. Marietta. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

17—Hycon Mfg. Co., Monrovia, Calif. \$2,428,508. Equipment and services or modification of aircraft cameras. Monrovia. Ogden Air Materiel Area (AFLC), Hill AFB, Utah.

—Holmes and Narver, Inc., Los Angeles, Calif. \$1,000,000. Operation and maintenance of the Air Force facility at Eniwetok, Marshall Islands. Air Force Western Test Range Div. (AFSC), Vandenberg AFB, Calif.

—Lockheed Missiles and Space Co., Sunnyvale, Calif. \$1,008,322. Production of AGENA boosters. Sunnyvale. Space Systems Div. (AFSC), Los Angeles, Calif.

19—International Telephone and Telegraph Corp., Federal Laboratories, Fort Wayne, Ind. \$1,110,314. Electronic data display equipment. Fort Wayne. Electronic Systems Div. (AFSC). L. G. Hanscom Field, Bedford, Mass.

—Olin Mathieson Chemical Corp., East Alton, Ill. \$1,892,000. Production of engine starter cartridges for F-105, B-52, and KC-135 aircraft. Marion, Ill.

—Bendix Corp., Radio Div., Baltimore, Md. \$2,666,840. Modification and improvement of the AN/FPS-85 space track radar. Towson, Md., and Elgin AFB, Fla. Rome Air Development Center, (AFSC), Griffiss AFB, N.Y.

—Aerodex, Inc., International Airport, Miami, Fla. \$1,357,397. Overhaul of R-4360 engines. Miami. San Antonio Air Materiel Area (AFLC), Kelly AFB, Tex.

—Progressive Construction Co., Inc., Farmville, Va. \$2,749,087. Construction of family housing at Langley AFB, Va. 4500th Air Base Wing, Langley AFB, Va.

21—Sylvania Electric Products, Inc., Waltham, Mass. \$1,199,052. Fabrication of a ground electronics system for MINUTEMAN Wing VI. Buffalo, N.Y. and Waltham. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—Boeing Co., Wichita, Kan. \$1,210,135. Modification of B-52 aircraft. Wichita. Oklahoma City. Air Materiel Area (AFLC), Tinker AFB, Okla.

24—AAXICO Airlines, Inc., Miami, Fla. \$9,617,020. Air Transportation Services within Continental U.S. Military Air Transport Service.

—Airlift International, Inc., Miami, Fla. \$5,419,686. International and Domestic Air Transportation Services. Military Air Transport Service.

—Alaska Airlines, Inc., Seattle, Wash. \$1,797,020. International and Domestic Air Transportation Services. Military Air Transport Service.

—Continental Airlines, Inc., Los Angeles, Calif. \$7,551,310. International and Domestic Air Transportation Services. Military Air Transport Service.

—Flying Tiger Line, Inc., Burbank, Calif. \$15,597,599. International Air Transportation Services in Pacific Area. Military Air Transport Service.

—Northwest Orient Airlines, Inc., St. Paul, Minn. \$12,889,290. International Transportation Services. Military Air Transport Service.

—Pan American World Airways, Inc., New York, N.Y. \$23,519,546. International Air Transportation Services. Military Air Transport Service.

—Seaboard World Airlines, Inc., Jamaica, L.I., N.Y. \$11,434,590. International and Domestic Air Transportation Services. Military Air Transport Service.

—Southern Air Transport, Inc., Washington, D.C. \$5,202,782. International Air Transportation Services. Military Air Transport Service.

—Trans Caribbean Airways, New York, N.Y. \$7,537,836. International Air Transportation Services. Military Air Transport Service.

—Trans International Airlines, Inc., Las Vegas, Nev. \$3,980,577. International Air Transportation Services. Military Air Transport Service.

—Trans World Airlines, Inc., New York, N.Y. \$6,193,618. International Air Transportation Services. Military Air Transport Service.

—World Airways, Inc., Oakland, Calif. \$9,707,615. International and Domestic Air Transportation Services. Military Air Transport Service.

—Zantop Air Transport, Inc., Inkster, Mich. \$9,934,862. Air Transportation Services within the Continental U.S. Military Air Transport Service.

25—American Electric, Inc., Paramount, Calif. \$3,016,000. Ordnance items. Paramount and El Cajon, Calif. Ogden Air Materiel Area (AFLC), Hill AFB, Utah.

26—Space Technology Laboratories (Thompson Ramo Woodridge, Inc.), Redondo Beach, Calif. \$3,000,000. Work, at Redondo Beach, on space programs. Space Systems Div. (AFSC), Los Angeles, Calif.

27—Boeing Co., Seattle, Wash. \$2,344,100. Modification of early MINUTEMAN missiles. Rapid City, S. D. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—Belock Instrument Corp., College Point, L.I., N.Y. \$3,264,413. Procurement of radar equipment, spare parts, and associated ground equipment. Lawrence, Mass. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

28—Sperry Rand Corp., Carle Place, N.Y. \$1,190,000. Procurement of LORAN navigation sets for C-130 aircraft. Carle Place. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—Kaman Aircraft Corp., Bloomfield, N.J. \$1,426,000. Production of H-43F helicopters and related equipment. Bloomfield. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—Goodyear Aerospace Corp., Litchfield Park, Ariz. \$1,572,789. MINUTEMAN missile transporter. Litchfield Park. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—Aerojet General Corp., Liquid Rocket Plant, Sacramento, Calif. \$2,837,000. Research and development for the TITAN III transtage. Sacramento. Space Systems Div. (AFSC), Los Angeles, Calif.

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## Joint NASA/Navy IQSY Solar Satellite Launch Planned

The National Aeronautics and Space Administration and the Naval Research Laboratory (NRL) will launch a satellite to measure and monitor solar X-ray emissions during the final portion of the 1964-65 International Quiet Sun Year (IQSY).

Launching of the IQSY Solar Explorer, developed by NRL, is expected in the second half of this year from NASA's Wallops Station, Wallops Island, Va.

Scientists throughout the world have been invited to participate in using data from the satellite. Information will be correlated with that of other worldwide scientists conducting studies related to IQSY, a period when solar activity is at a minimum.

The IQSY Solar Explorer, by measuring and monitoring solar X-ray emissions and providing immediate data to interested scientists, has the potential for improving forecasts of ionospheric conditions that affect short-wave radio communications.

The 125-pound spacecraft consists of two 24-inch hemispheres separated by equatorial band in which nine photometers for measuring X-ray emissions are installed. Electrical power is supplied by solar cells mounted on the hemispheres.

The spin-stabilized satellite will be placed into a 400 by 630 statute mile (350 by 550 nautical mile) orbit inclined 60 degrees to the Equator. Expected active lifetime is one year.

The spacecraft will complement and continue the missions of other NASA spacecraft and the NRL's Solar Radiation satellite 1964-01D, launched in January 1964.

The NASA Office of Space Science and Applications (OSSA) has overall direction of the IQSY Solar Explorer and Wallops Station is responsible for project coordination.

Responsibility for command and acquisition of recorded data will be carried out by NRL through its Tracking and Command Station in Hybla Valley, Va.

The NASA Goddard Space Flight Center, Greenbelt, Md., will be responsible for tracking the satellite during its useful life and will support NRL in data acquisition and recording of telemetered data from the satellite.

### DSA to Furnish Electronic Supplies to NASA

The Defense Supply Agency will furnish an estimated \$1.5 million worth of electronic items annually on a reimbursable basis to the National Aeronautics and Space Administration as a result of an interagency agreement approved by the two agencies.

The agreement, which will involve approximately 12,000 centrally managed items at DSA's Defense Electronics Supply Center (DESC), Dayton, Ohio, was formally approved by John D. Young, Deputy Associate Administrator, NASA, and Major General Francis C. Gideon, USAF, Deputy Director, DSA. Fourteen NASA installations and distribution points will receive support from DESC, beginning July 1.

Among the major NASA projects to receive support from DSA are manned space exploration involving the Gemini and Apollo programs; unmanned investigations of earth, moon, sun and planets employing sounding rockets, orbiting spacecraft, and interplanetary probes; development of meteorological and communications satellite systems; and advanced research and technological development to support United States aeronautical and space programs.